Tomcat i945GM /// S3095

Version 1.1

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Check the box contents!

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	1 x Serial ATA Cable
	1 x Printer Port Cable
	1 x M3095 Audio Daughter Card
	1 x Audio Cable
	1 x USB Header Cable
	1 x IEEE1394 Header Cable
	1 x S3095 user's manual
	1 x S3095 Quick Reference guide
	1 x TYAN driver CD
	1 x I/O shield

If any of these items are missing, please contact your vendor/dealer for replacement before continuing with the installation process.

NOTE

Chapter 1: Introduction

1.1 - Congratulations

You have purchased one of the most powerful server solutions. The Tomcat i945GM (S3095) is a flexible Intel® platform for multiple applications, based on Intel® "945GM" and "ICH7M-DH" chipsets.

Designed to support Intel® Core Duo/Core Solo/Celeron M(533MHz) processors and DDRII 400 memory up to 2GB, the S3095 is featured with integrated Dual Gigabit Ethernet LAN, Intel GMA950 graphics and two serial ATA ports. With the multiple features designed, the S3095 offers exceptional performance and versatile solution for your server platform.

Remember to visit TYAN's Website at http://www.TYAN.com. There you can find information on all of TYAN's products with FAQs, online manuals and BIOS upgrades.

1.2 - Hardware Specifications

Processors

- One 478-pin Socket supports Intel CPU (Yonah) as below:
  - Core™ 2 Duo w/ 4M L2, up to 2.33GHz (667)
  - Core™ 2 Duo w/ 2M L2, up to 1.83GHz (667)
  - Core™ Duo w/ 2M L2, up to 2.33GHz (667)
  - Core™ Duo ULV w/ 2M L2, up to 1.2GHz (533)
  - Core™ Solo w/ 2M L2, up to 1.83GHz (667)
  - Celeron™ M w/ 1M L2, up to 2GHz (533)
- Front-Side Bus support for 667/533 MHz

Memory

- Dual channel memory bus (must be populated in pairs)
- Two 240-pin DDR2 sockets, support up to 2 GB memory capacity
- Supports Un-buffered DDR2 667/533/400 Compliant Non-ECC memory
- Supports 128MB, 256MB, 512MB,

Integrated I/O (continued)

- Two 1394a pin header
- One FDD connector
- One shrouded header for serial port
- One FPIO header
- One FP-Audio header
- One CD-IN header (on M3095)
- One Aux-in header (on M3095)

Back Panel I/O Ports

- One serial port
- One VGA connector
- One DVI connector
- Two stacked USB 2.0 ports
- Two GbE LAN ports & one 10/100M LAN port with RJ45 connector includes Transformer & LED
- Printer port(via cable)

System Management

- Total three 3-pin fan headers with control and tachometer monitoring
- Monitors voltage for CPU, Memory

1GB DDR2 DIMM

Chipset
- Intel 945GM Memory Controller Hub
- Intel ICH7M-DH I/O Controller Hub

Integrated LAN Controllers
- Two Intel 82573 PCI-E single port GbE Controllers
- Intel 82551QM 10/100 LAN controller x 1

Graphics
- Integrated Graphics support
- Two serial digital video out port (SDVO) interface support for DVI, LVDS

Expansion Slot
- Supports 1 PCI-E x4 device
- Supports 1 PCI expansion slot
- One Mini-PCI Slot

Integrated SATA Controller
- SATA ports from ICH7M-DH
- RAID 0, 1 supported

Integrated I/O
- One 40-pin IDE connector or one 50-pin Compact Flash Type II connector (see available models)
- 2 SATA connectors
- One LVDS connector
- One pin header for USB ports (supports two USB 2.0 devices)

& Power Supply
- Monitoring temperature for CPU & environment
- Pin header for Fault LED, Power/Suspend LED & HDD activity LED
- One pin header for Chassis Intrusion detection
- Watch Dog Timer supported
- Console redirection supported

Accessory
- Bracket with Line(S/PDIF)-In/Line(S/PDIF)-Out/Mic-In and Phone (Realtec ALC888)

BIOS
- Phoenix BIOS® on 8Mbit Flash ROM
- Supports ACPI 2.0
- Supports boot from USB device
- WOL and PXE support
- Power-on mode control for AC power loss recovery

Form Factor
- Flex ATX form factor (9.0”x7.5”; 229x191mm)

Available Models

Model	IDE connector	CF socket
S3095G3NR	Yes	N/A
S3095G3NR-CF	N/A	Yes

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting hole pattern of the Tomcat i945GM S3095 matches the Flex ATX specification. Before continuing with installation, confirm that your chassis supports a Flex ATX motherboard.

How to install our products right… the first time

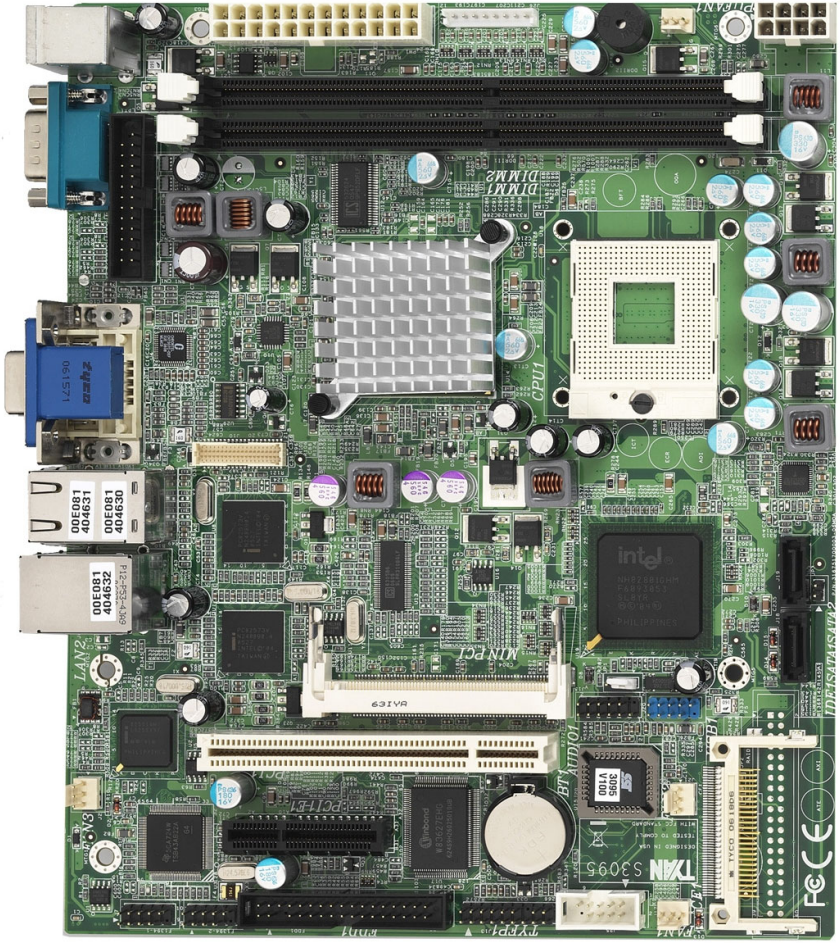
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

NOTE	**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

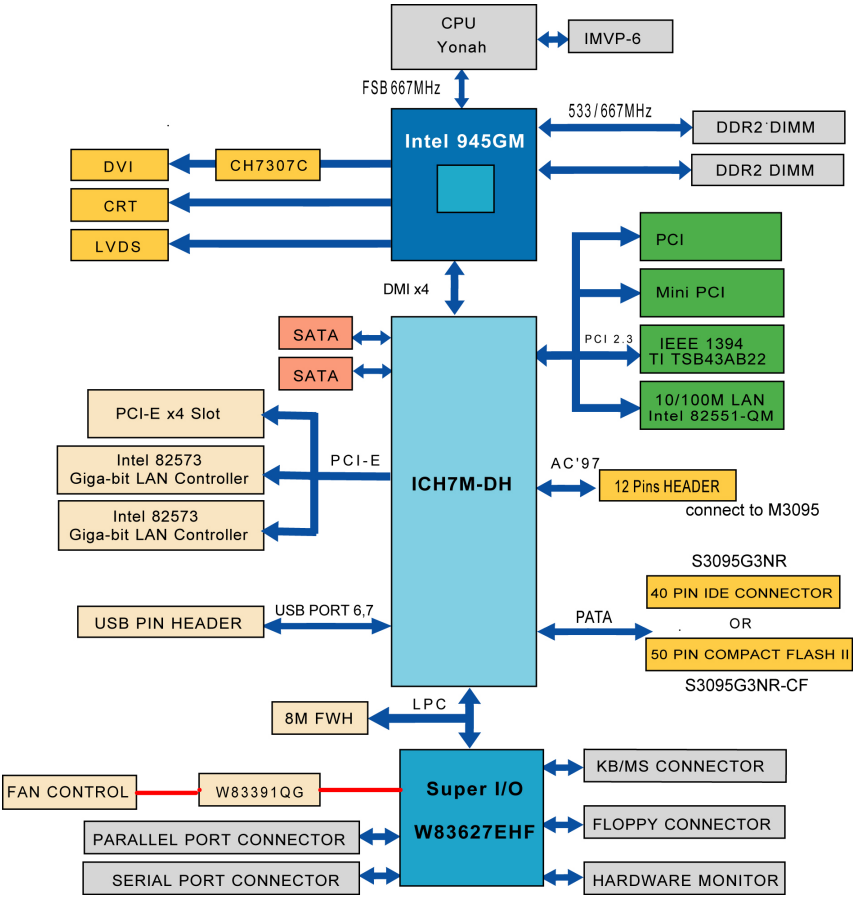
2.1- Board Image



S3095G3NR-CF

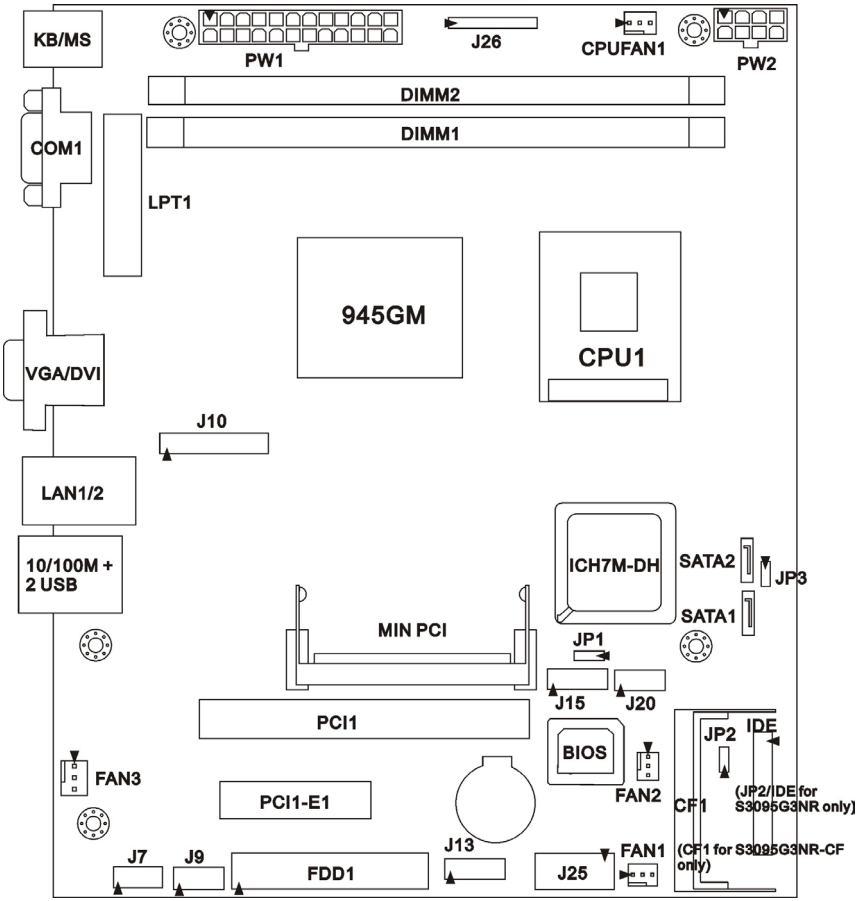
This picture is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like the above picture.

2.2 - Block Diagram



Tomcat i945GM S3095 Block Diagram

2.3 Board Parts, Jumpers and Connectors

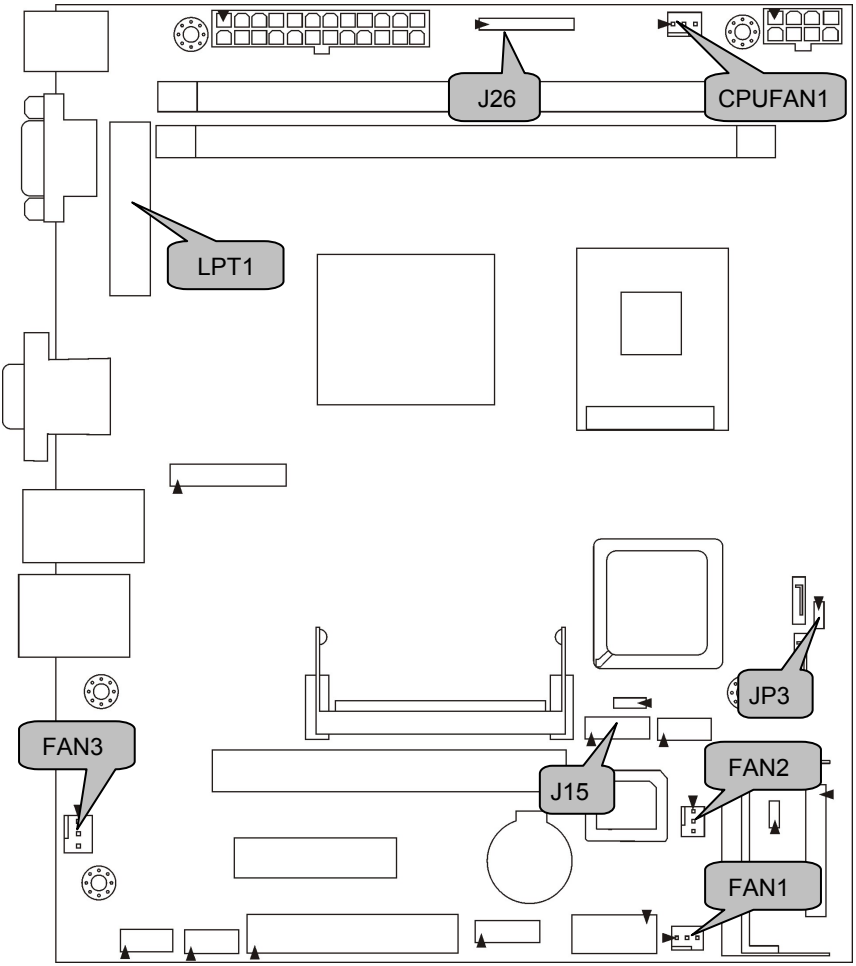


This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

Jumper Legend

▣▣	**OPEN** - Jumper OFF, without jumper cover
▣▣	**CLOSED** – Jumper ON, with jumper cover

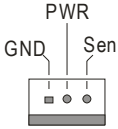
Jumper/Connector	Function
CPUFAN1	CPU Fan Connector
FAN1/FAN2/FAN3	Chassis FAN Connector
J10	LVDS Connector
J26	LVDS Power Connector
J15	Audio Card Connector
J13	Front Panel Header
J20	USB Header
LPT1	Printer Port connector
J25	Secondary COM Port Header
J7	IEEE 1394 Port 1 Header
J9	IEEE 1394 Port 2 Header
MIN PCI	Mini PCI slot
JP1	Clear CMOS Jumper
JP2	IDE 20th Pin 5V Enable/Disable Jumper (for DOM, S3095G3NR only)
JP3	Suspend LED Header
IDE	40-pin IDE connector(S3095G3NR only)
CF1	CF Card Connector(S3095G3NR-CF only)



J26: LVDS Power Connector

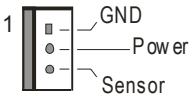
 Connector: ARC 5W1.2411C-11100.108	Use this header to connect the Power of LCD panel. Please read the LCD panel pin definition before plug in.

CPUFAN1: CPU Fan Connector



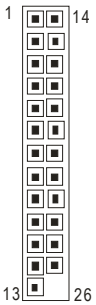
Use this header to connect the processor cooling fan to your motherboard to keep the system stable and reliable.

FAN1/FAN2/FAN3: Chassis Fan Connector



Use this header to connect the processor cooling fan to your motherboard to keep the system stable and reliable.

LPT1: Parallel Port Header

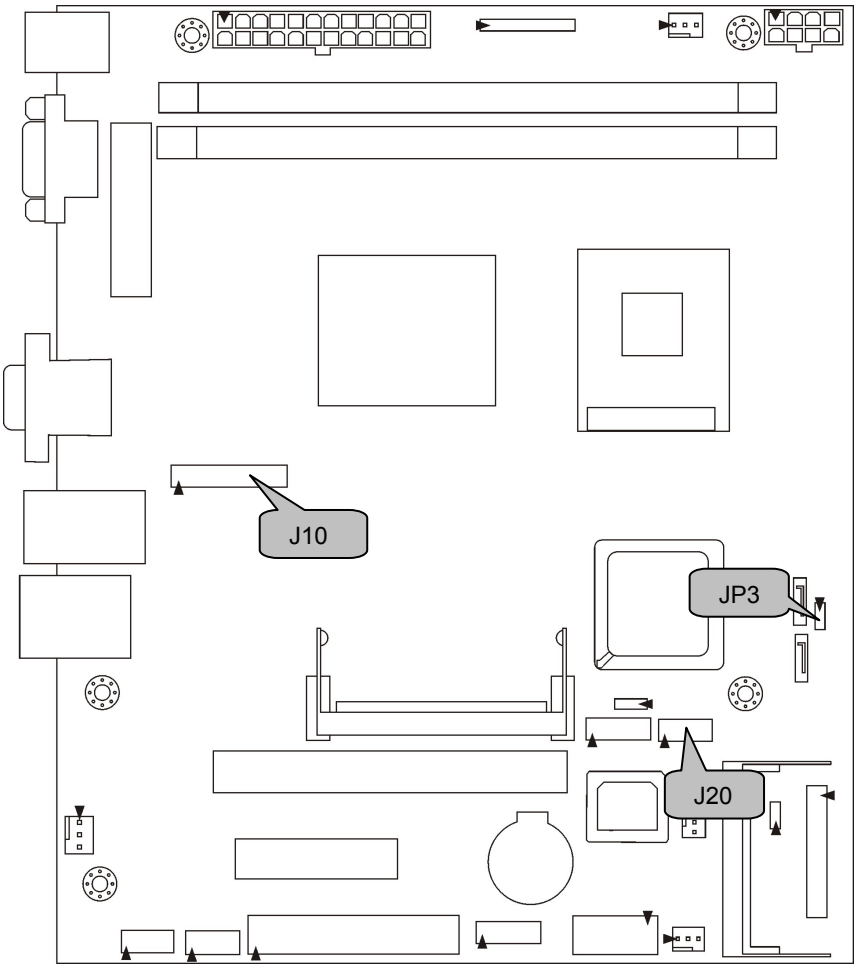


The main board provides a 25-pin connector as parallel port header. A parallel port is a standard printer port that supports EPP and ECP mode.

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	PD0	4	ERR#
5	PD1	6	INIT#
7	PD2	8	SLIN#
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	KEY

J15: Audio Card pin header
(connected to Tyan M3095 Audio daughter card J6 via audio cable)

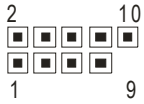
Signal	Pin	Pin	Signal
HD_Audio_Reset	**1**	**2**	VCC12V
Bit Clock	**3**	**4**	5V standby
Sync	**5**	**6**	Serial Data Out
Ground	**7**	**8**	Serial Data In
Ground	**9**	**10**	SPKR
14MHz clock	**11**		



JP3: Suspend LED Header

1 	You may see the system status via the Suspend LED Header.

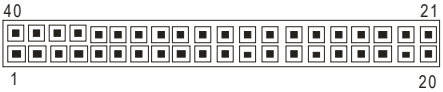
J20 (USB1): USB Front Header



Use this header to connect to front panel USB connector.

Signal	Pin	Pin	Signal
+5V	1	2	+5V
Data 0-	3	4	Data 1-
Data 0+	5	6	Data 1+
GND	7	8	GND
		10	NC

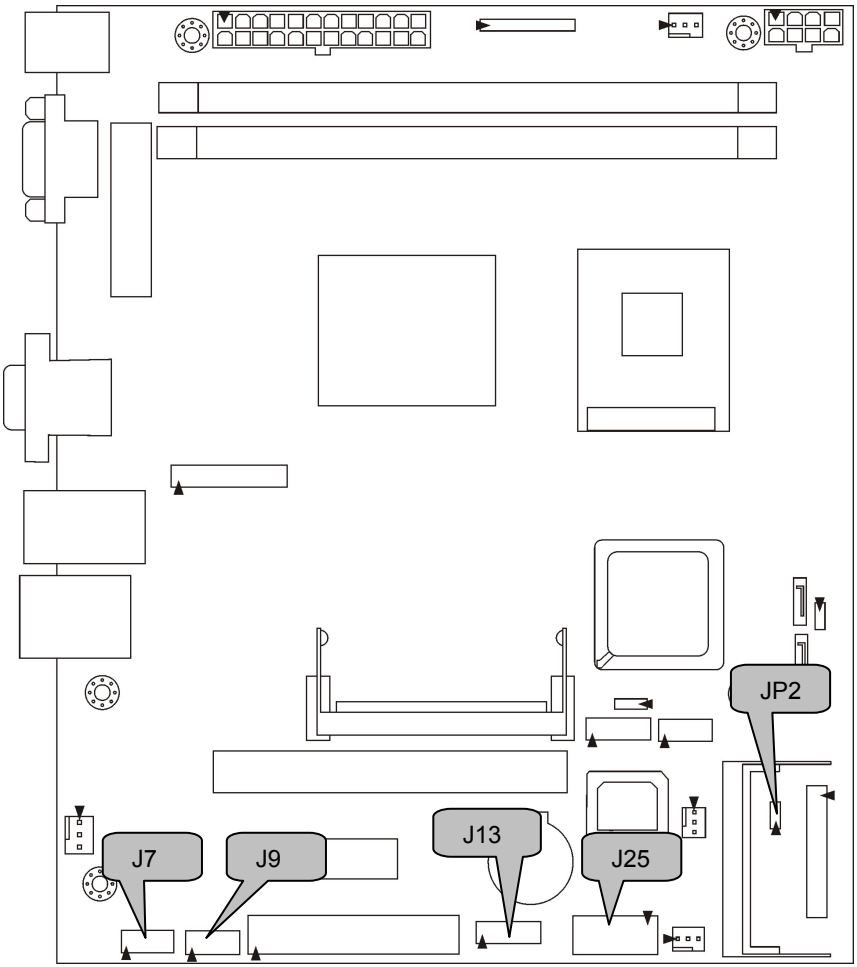
J10: LVDS connector



Connector: IPEX 20381-040E-00F

The S3095 offers the possibility to connect LCD panel through LVDS connector. Please read the LCD panel signal pin assignment.

Pin	Signal	Pin	Signal
1	VSS	40	VCC3
2	VCC5	39	VCC3
3	VCC5	38	V_EDDID
4	Clk_EDID	37	DATA_EDID
5	VSS	36	Odd_Rin0-
6	Odd_Rin0+	35	VSS
7	VSS	34	Odd_Rin1-
8	Odd_Rin1+	33	VSS
9	VSS	32	Odd_Rin2-
10	Odd_Rin2+	31	VSS
11	VSS	30	Odd_ClkIN-
12	Odd_ClkIN+	29	VSS
13	VSS	28	Even_Rin0-
14	Even_Rin0+	27	VSS
15	VSS	26	Even_Rin1-
16	Even_Rin1+	25	VSS
17	VSS	24	Even_Rin2-
18	Even_Rin2+	23	VSS
19	VSS	22	Even_CLKIN-
20	Even_CLKIN+	21	VSS

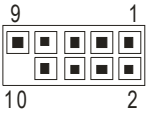


JP2: IDE 20th Pin 5V Enable/Disable Jumper (for DOM, S3095G3NR only)

Use this jumper to enable/disable the internal DOM power for IDE 20th pin.

Pin 1	NC	Pin 2	DOM_PWR_SEL
Pin 3	VCC5		

J25: COM Port Header



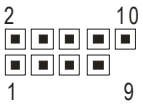
The mainboard offers one 9-pin Serial port header. You can attach a serial mouse or other serial devices directly to it.

Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9		

J13: Front Panel Header

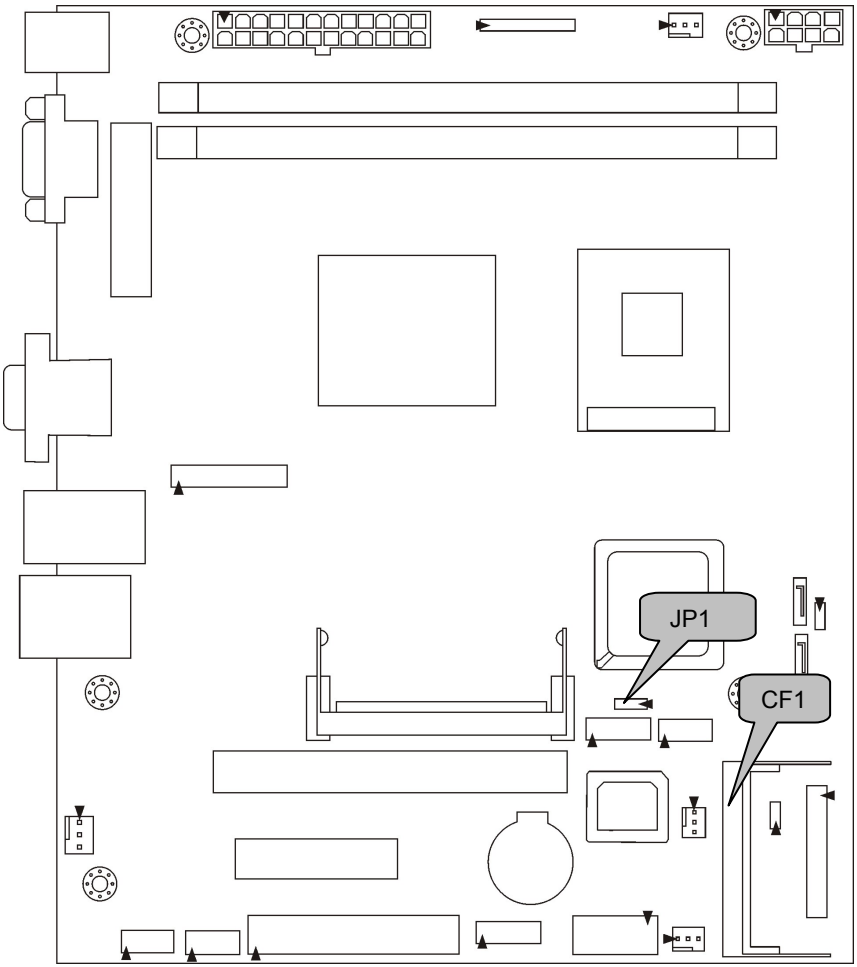
The Front Panel Header is used to connect some control or signal wires from motherboard to chassis, such as HDD LED, power LED, power button, and reset button.

J7/J9: IEEE1394 Pin header

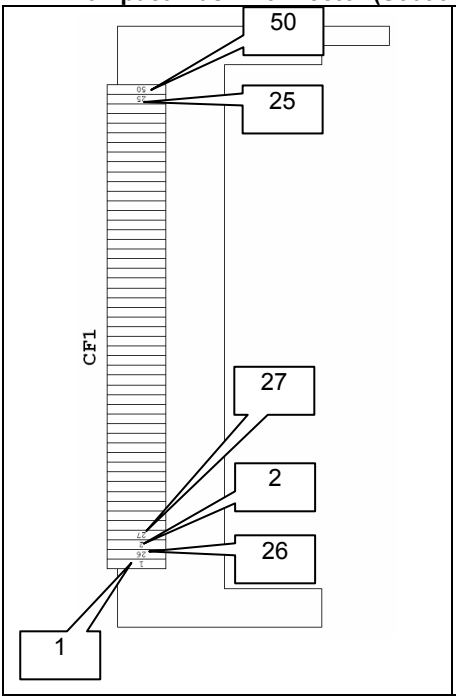


The mainboard offers two 9-pin headers as IEEE1394 port. You can attach IEEE1394 devices directly to it.

Signal	Pin	Pin	Signal
TPA+	1	2	TPA-
GND	3	4	GND
TPB+	5	6	TPB-
Bus Power	7	8	Bus Power
		10	GND


JP1
CF1

CF1: Compact Flash Connector (S3095G3NR-CF only)



Pin	Signal	Pin	Signal
1	GND	26	GND
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS#	32	CS1#
8	GND	33	GND
9	GND	34	IORD#
10	GND	35	IOWR#
11	GND	36	WE#
12	GND	37	INTRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	NC
16	GND	41	RST#
17	GND	42	IORDY#
18	A2	43	DMARQ
19	A1	44	DMACK#
20	A0	45	DASP#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	NC	49	D10
25	GND	50	GND

JP1: Clear CMOS Jumper

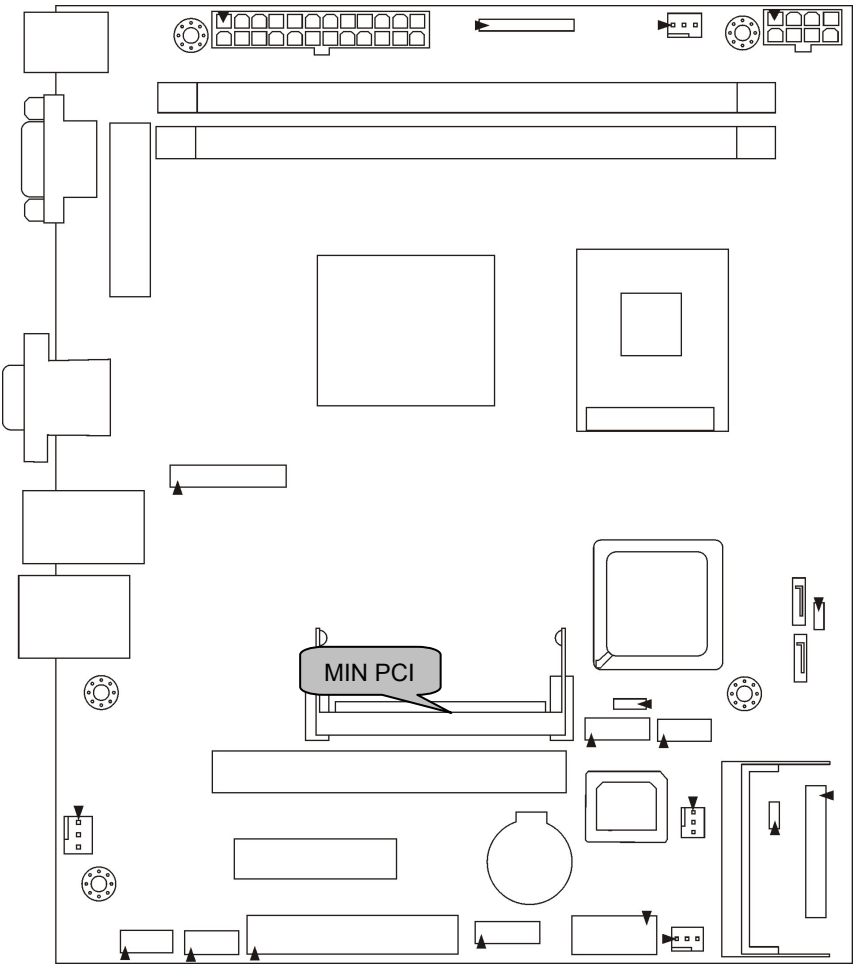
(Clear)

(Normal)

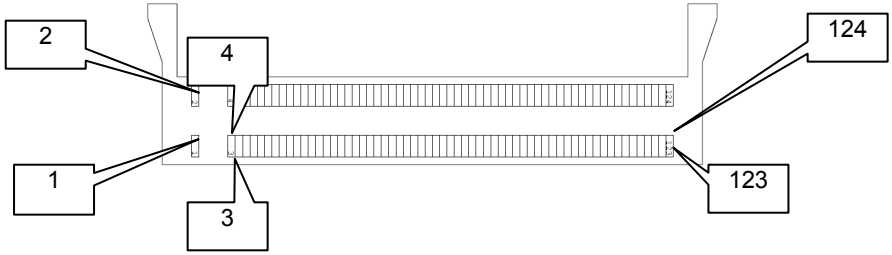
Use this jumper when you forgot your system/setup password or need to clear system BIOS setting.
How to clear the CMOS data

- Power off system and **disconnect power supply from AC source**
- Use jumper cap to close Pin_2 and 3 for several seconds to Clear CMOS
- Replace jumper cap to close Pin_1 and 2 Reconnect power supply to AC source
- Power on system

Pin	Signal
1	NC
2	RTCRST#
3	GND


MIN PCI

MIN PCI: Mini PCI Socket



PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	NC	2	NC	63	3.3V	64	FRAME#
	KEY		KEY	65	CLKRUN#	66	TRDY#
3	NC	4	NC	67	SERR#	68	STOP#
5	NC	6	NC	69	GND	70	3.3V
7	NC	8	NC	71	PERR#	72	DEVSEL#
9	NC	10	NC	73	C / BE#	74	GND
11	NC	12	NC	75	AD14	76	AD15
13	NC	14	NC	77	GND	78	AD13
15	NC	16	RESERVED	79	AD12	80	AD11
17	INTB#	18	5V	81	AD10	82	GND
19	3.3V	20	INTA#	83	GND	84	AD9
21	RESERVED	22	RESERVED	85	AD8	86	C / BE0#
23	GND	24	3.3VAUX	87	AD7	88	3.3V
25	CLK	26	RST#	89	3.3V	90	AD6
27	GND	28	3.3V	91	AD5	92	AD4
29	REQ#	30	GNT#	93	RESERVED	94	AD2
31	3.3V	32	GND	95	AD3	96	AD0
33	AD31	34	PME#	97	5V	98	RESERVED
35	AD29	36	RESERVED	99	AD1	100	RESERVED
37	GND	38	AD30	101	GND	102	GND
39	AD27	40	3.3V	103	NC	104	NC
41	AD25	42	AD28	105	NC	106	NC
43	RESERVED	44	AD26	107	NC	108	NC
45	C / BE3#	46	AD24	109	NC	110	NC
47	AD23	48	IDSEL	111	NC	112	RESERVED
49	GND	50	GND	113	NC	114	GND
51	AD21	52	AD22	115	NC	116	NC
53	AD19	54	AD20	117	NC	118	NC
55	GND	56	PAR	119	NC	120	NC
57	AD17	58	AD18	121	RESERVED	122	MPCIACT#
59	C / BE2#	60	AD16	123	VCC5VA	124	3.3VAUX
61	IRDY#	62	GND				

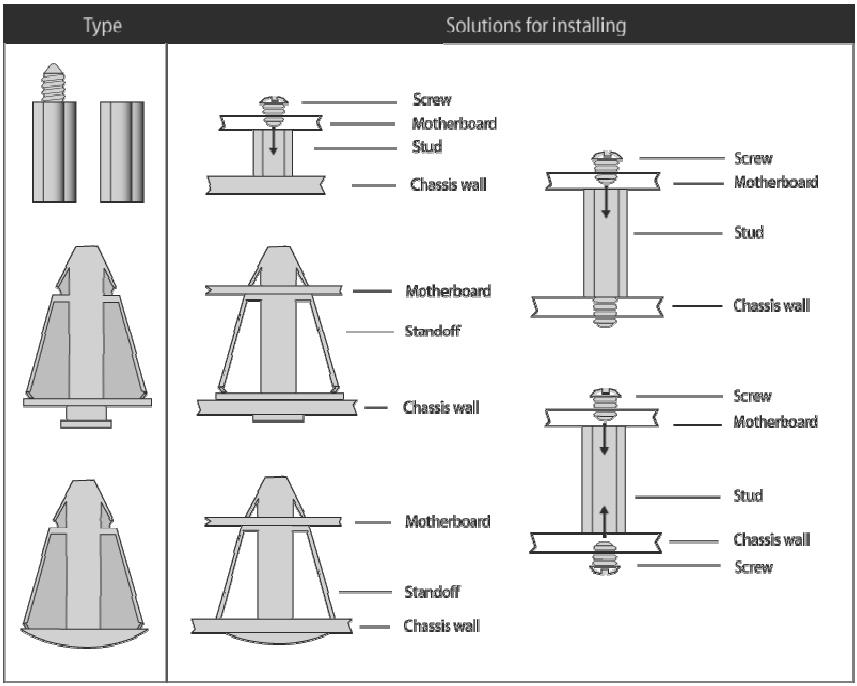
2.4 - Tips on Installing Motherboard in Chassis

Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.

Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.5 - Installing the Processor, Heatsink & Fan

Your Tomcat i945GM S3095 supports the latest processor technologies from Intel. Check the TYAN website for latest processor support:

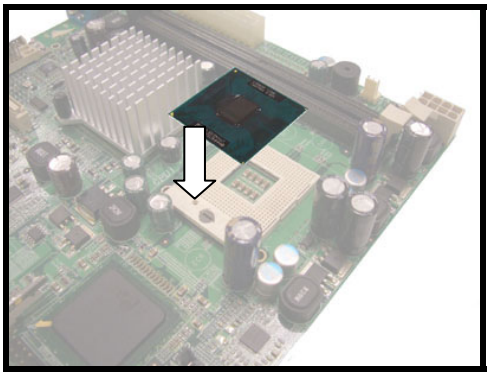
http://www.tyan.com

CPU & Heatsink Installation

The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.

Follow these instructions to install your processor

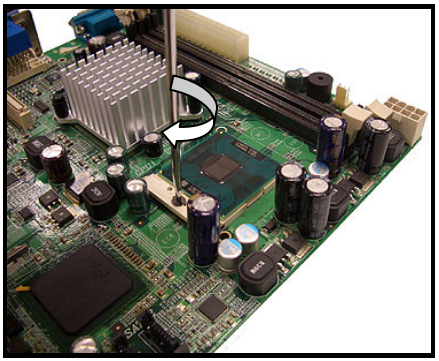
1. Place the CPU in the socket ensuring that the edge of golden arrow is aligned with the breach edge of CPU socket.

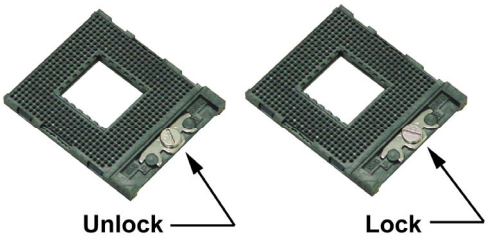


WARNING:

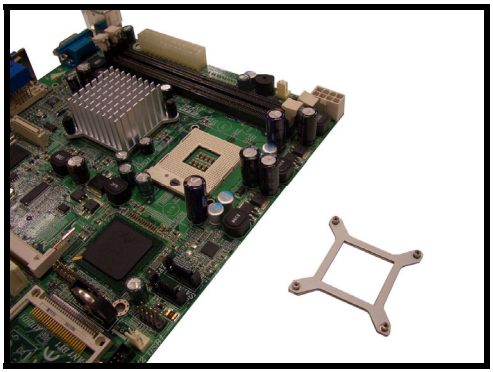
This new processor socket designed by Intel is easy to be damaged. The processor has to be installed very carefully to prevent the contact pins of the socket from breaking. It is strongly recommended the processor installation job to be handled by the experienced technician.

2. Use a flat screw driver to lock the CPU after installation. Refer to the picture below for the direction of locking and unlocking.

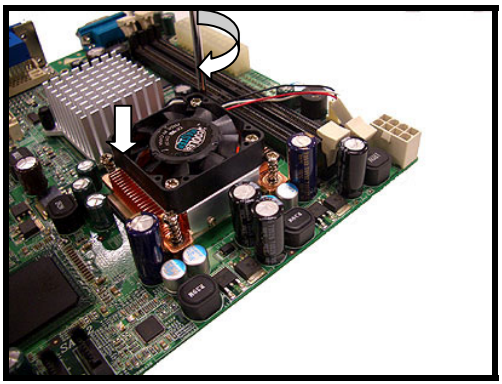




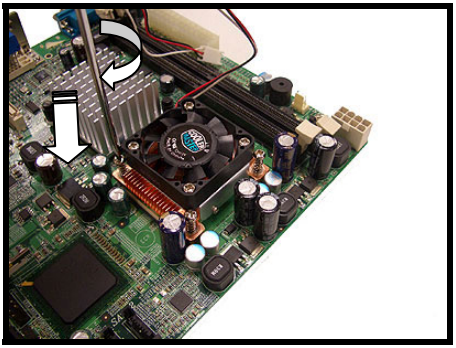
3. Install the retention module into the CPU socket from the reverse of motherboard. **Tear off the stick on the retention module before installing**.



4. Place the heatsink on the CPU. Use a screw driver to fix the installation of heatsink.



5. Follow the direction suggested as below to finish the installation.



Cooling Fan Installation

After you have installed the processor, the heatsink should be installed to ensure that the processor runs efficiently and does not overheat. Use the heatsink supplied for best results.

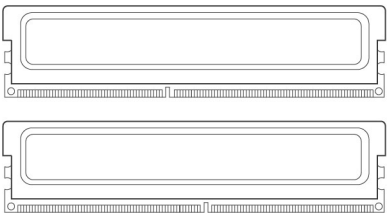
Follow these instructions to install the heatsink shown.

1. Apply some (a little will work, more doesn't equal better performance) thermal compound to the top of the processor. Try and apply a thin, even layer over the top of the processor.
2. Align the heatsink with the four holes around the processor socket.
3. Press the heatsink down until the four screws are securely seated in the holes.
4. Use screw drive to secure the four screws.

2.6 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor. Only DDRII 400/533/667 modules are required. Check the TYAN Web site at: **www.tyan.com** for details of the type of memory recommended for your motherboard.

The following diagram shows common types of DDRII memory modules.



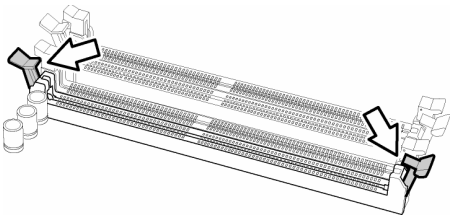
Key points to note before installing memory:

- Supports Un-buffered DDRII 400/533/667 compliant with Non-ECC memory.
- All installed memory will automatically be detected and no jumpers or settings need changing.
- The S3095 supports up to 2GB of memory.

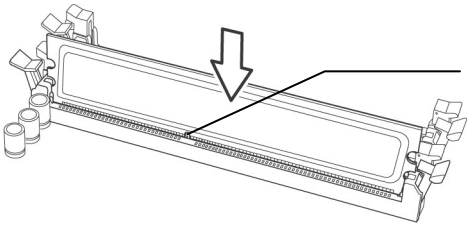
Memory Installation Procedure

Follow these instructions to install memory modules into the S3095.

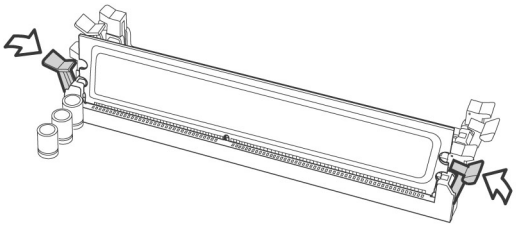
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.

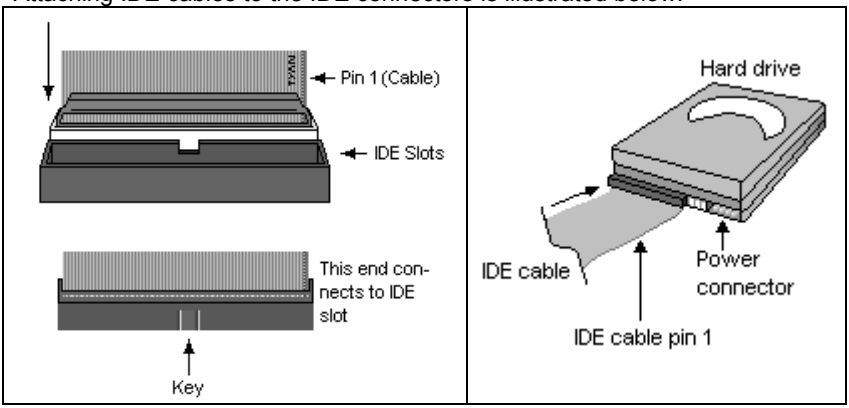


2.7 - Attaching Drive Cables

Attaching IDE Drive Cable (S3095G3NR only)

Attaching the IDE drive cable is simple. These cables are “keyed” to only allow them to be connected in the correct manner. TYAN motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

Attaching IDE cables to the IDE connectors is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

NOTE: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

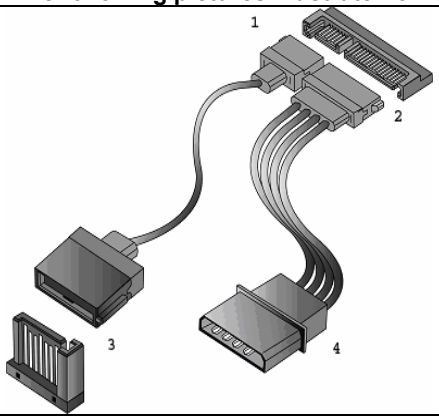
TIP: Pin 1 on the IDE cable (usually designated by a colored wire) faces the drive’s power connector.

Attaching Serial ATA Cables
The S3095 is also equipped with 2 Serial ATA (SATA) channels. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

Tyan has supplied one SATA cable. If you are in need of other cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



1.SATA drive cable connection

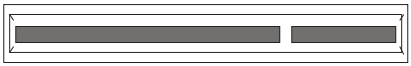
2. SATA drive power connection

3. SATA cable motherboard connector

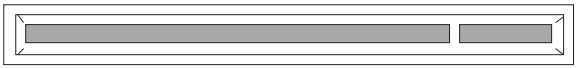
4. SATA drive power adapter

2.8 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that appear on your motherboard.



PCI Express X4 Slot



PCI Slot

Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

PCI IDESELs and IRQ Assignments

PCI Slot	IDSEL	INTA	INTB	INTC	INTD
Slot 1	PCI_AD22	PIRQ G	PIRQ H	PIRQ E	PIRQ F
Slot 2	PCI_AD21	PIRQ F	PIRQ G	PIRQ H	PIRQ E
82551QM	PCI_AD16	PIRQ A	N/A	N/A	N/A
VGA RN50	PCI_AD28	PIRQ H	N/A	N/A	N/A

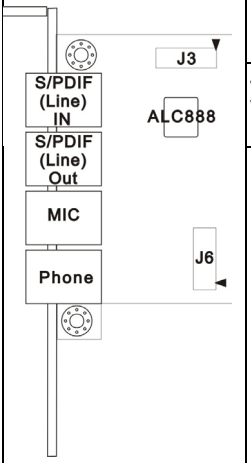
PCIX Slot	IDSEL	INTA	INTB	INTC	INTD
Slot 1	PCIX_AD17	PIRQ 0	PIRQ 1	PIRQ 2	PIRQ 3
Slot 2	PCIX_AD18	PIRQ 1	PIRQ 2	PIRQ 3	PIRQ 0
TARO	PCIX_AD19	PIRQ 2	PIRQ 3	N/A	N/A

NOTE

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

2.9 Installing M3095 Audio daughter card

To provide great audio experience, Tyan S3095 is including M3095, the audio daughter card with Realtec ALC888 in the box. Here is the pin assignment list for Tyan M3095.

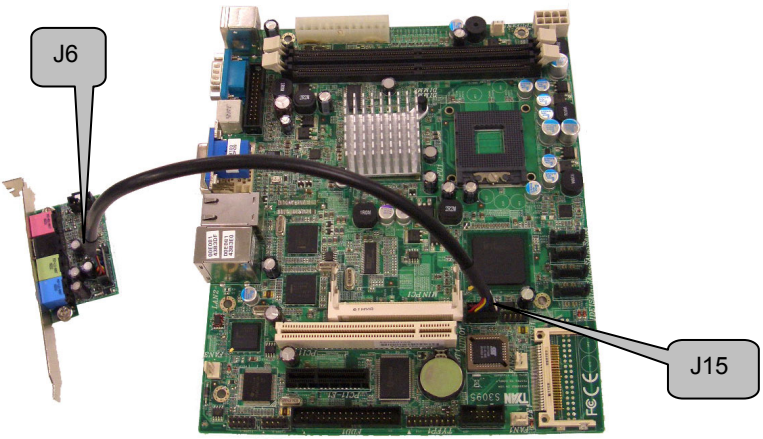


J3 CD-IN

J6 Audio Card pin header (connect to Tyan S3095 J15 via audio cable in the box)

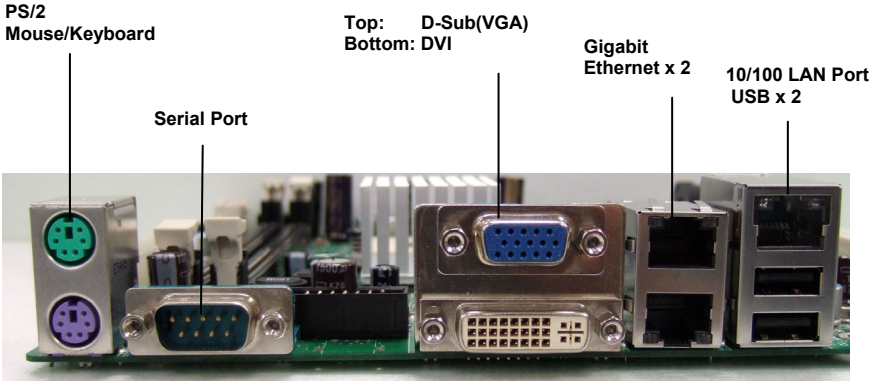
Signal	Pin	Pin	Signal
HD_Audio_Reset	1	2	VCC12V
Bit Clock	3	4	5V standby
Sync	5	6	Serial Data Out
Ground	7	8	Serial Data In
Ground	9	10	SPKR
14MHz clock	11		

The illustration for connecting Tyan S3095 (J15) and M3095 (J6):



2.10 Connecting External Devices

The following diagrams will detail the rear port stack for this S3095 motherboard:



NOTE: Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

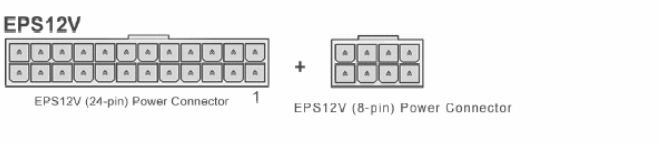
Onboard LAN LED Color Definition

The three onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
LEFT RIGHT		Left LED	Right LED
10 Mbps	Link	Green	Off
	Active	Blinking Green	Off
100 Mbps	Link	Green	Green
	Active	Blinking Green	Green
1000 Mbps	Link	Green	Yellow
	Active	Blinking Green	Yellow
No Link		Off	Off

2.11 - Installing the Power Supply

There are two power connectors on your Tomcat i945GM. The Tomcat i945GM S3095 requires that you have an EPS12V power supply that has a 24-pin and an 8-pin power connector. Please be aware that ATX 2.x, ATX12V and ATXGES power supplies may **not** be compatible with the board and can damage the motherboard and/or CPU(s).



Applying power to the board

1. Connect the EPS 12V 8-pin power connector.
2. Connect the EPS 12V 24-pin power connector.
3. Connect power cable to power supply and power outlet

NOTE	**YOU MUST** unplug the power supply before plugging the power cables to motherboard connectors.

2.12 - Finishing up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

NOTE

Chapter 3: BIOS Setup

3.1. About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:
1. Turn on or reboot your system.
2. Press <F2> during POST (F4 on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**F1**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by TYAN or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

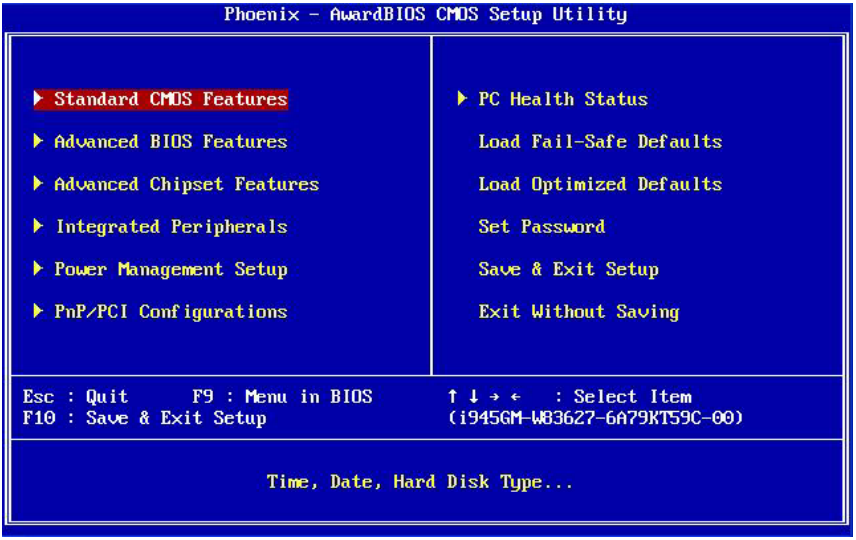
3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit Tyan's website at http://www.tyan.com for the information of BIOS updating.

3.2 BIOS Main Menu

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen.



Standard CMOS Features
Use this menu for basic system configuration.

Advanced BIOS Features
Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PnP / PCI Configuration
This entry appears if your system supports PnP / PCI.

PC Health Status
Use this menu to show your system temperature, speed and voltage status.

Load Fail-Safe Defaults
Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults
Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Phoenix-Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

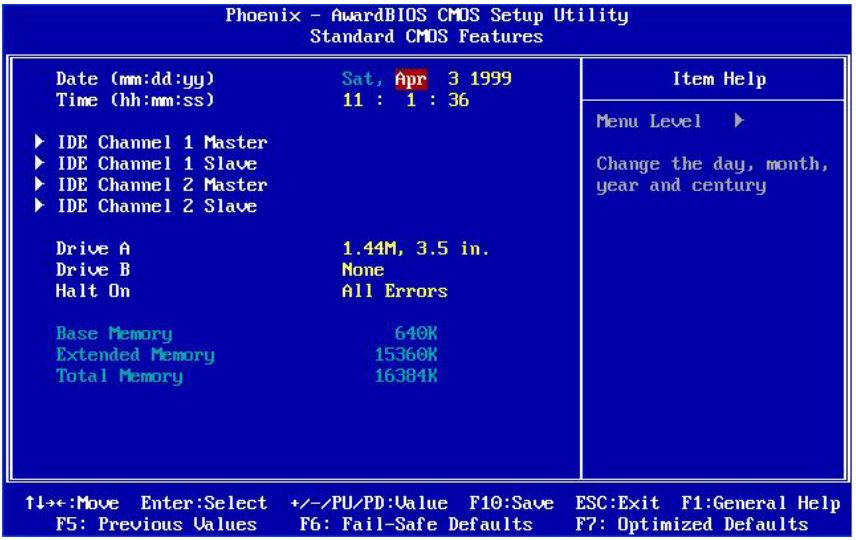
Set Password
Use this menu to set User's Password.

Save & Exit Setup
Save CMOS value changes to CMOS and exit setup.

Exit Without Saving
Abandon all CMOS value changes and exit setup.

3.3 Standard CMOS Features

In this section, you can alter general features such as the date and time, as well as access to the IDE configuration options. Note that the options listed below are for options that can directly be changed within the Main Setup screen. Users use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date / Time Setup
Date: Adjusts the system date:
mm Months
dd Days
yyyy Years
Time: Adjusts the system clock.
hh Hours (24hr. format)
mm Minutes
ss Seconds

Drive A / B
Defines the floppy drive type.
• None
• 360K, 5.25in
• 1.2M, 5.25in
• 720K, 3.5in
• **1.44M, 3.5in**
• 2.88M, 3.5in

Halt On
Determines if the computer should stop when an error is detected during power up.
• No Errors
• **All Errors**
• All, But Keyboard
• All, But Diskette
• All, But Disk/Key

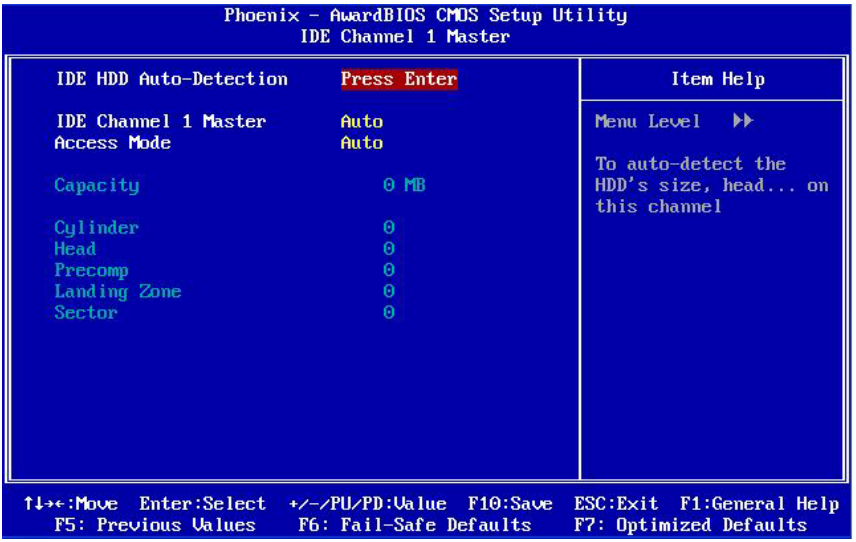
Base Memory (read only)
This item displays the amount of base memory installed in the value of the base memory is typically 640K for system with 640K memory size installed on the motherboard.

Extended Memory (read only)
This item displays the amount of extended memory detected boot-up.

Total Memory (read only)
This item displays the total memory available in the system.

3.3.1 IDE Master / Slave Setup

Computer detects IDE drive type from drive C to drive F.
Press **[Enter]** on any of the Master/Slave options to view advanced details of the corresponding drive.

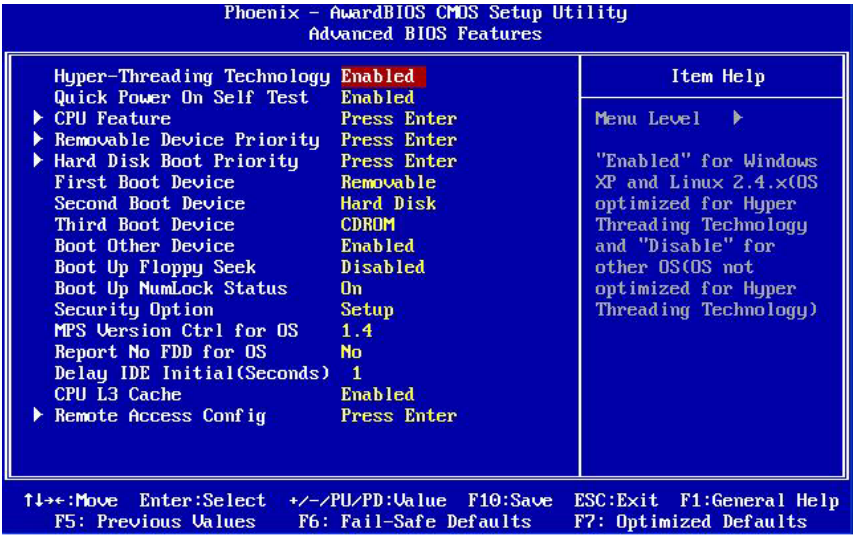


The system displays advanced details like the number of heads / cylinders / sectors on the detected disk and the maximum storage capacity of the disk.

IDE HDD Auto-Detection
To auto-detect the HDD's size, head…on this channel.

3.4 Advanced BIOS Features

In Advanced BIOS features, you will be able to adjust many features that affect system speed and boot-up options.



Hyper-Threading Technology
Enable this only if you have an Intel Hyper Threading processor.
Enabling Hyperthreading activates additional CPU threads. These threads may appear as additional processors but will share some resources with the other threads within the physical package.
• **Enabled**
• Disabled

Quick Power On Self Test
This option allows the system to skip self-tests for faster startup.
• **Enabled**
• Disabled

First, Second, and Third Boot Devices
These indicate the boot priority. For example if the First Boot Device is set as Removable, the Second Boot Device as CDROM, and the Third Boot Device as Hard Disk, then the system will try to boot from a removable drive, failing which it will try to boot from a CDROM, and if this also fails, it will try to boot from the Hard Disk.

Boot Other Device
This option allows the system to boot from any other bootable device.
• **Enabled**
• Disabled

Boot Up Floppy Seek
During Power-On Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks.
• **Enabled**
• Disabled

Boot Up NumLock Status
This option, when enabled, automatically turns on your NumLock key when the system is booted. This is a matter of personal taste.
• **On**
• Off

Security Option
Setting this option to System will set the BIOS to ask for the password each time the system boots up. If you choose Setup, then the password is only required for access into the BIOS setup menus.
• **Setup**
• System

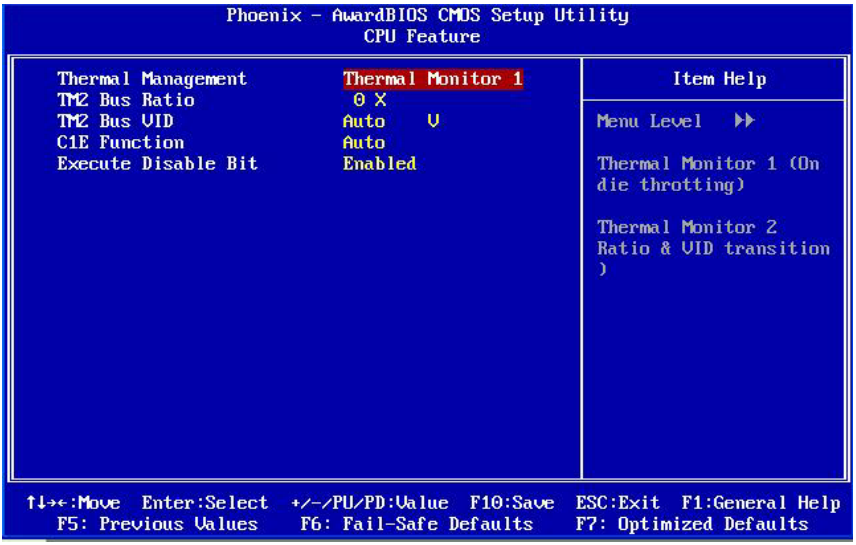
MPS Version Control For OS
This feature is only applicable to multiprocessor motherboards as it specifies the version of the Multi-Processor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.
MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future.
In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge. Select the MPS version depending on the operating system installed: select 1.1 for Win NT
3.52, and 1.4 for Win NT4.0, Win2000, and WinXP.
• 1.1
• **1.4**

Report No FDD For OS
Set this option to Yes if you are using Windows 95/98 without a floppy to release IRQ6 (this is required to pass Windows 95/98's SCT test and get the logo).
• **No**
• Yes

Delay IDE Initial(Seconds)
This defines the delay (in seconds) between detecting and starting IDE devices.
• **0~15,** the default is 1.

CPU L3 Cache
This item allows users to enable or disable the CPU L3 cache.
• **Enabled**
• Disabled

3.4.1 CPU Feature
Press [Enter] to access advanced features of the CPU.



Thermal Management
Thermal Management throttles the processor back as it reaches its maximum operating temperature. Throttling reduces the number of processing cycles, thereby diminishing the heat dissipation of the CPU. This cools the unit. Once the CPU has reached a safe operating temperature, thermal throttling is automatically disabled, and normal full speed processing begins again.
The BIOS supports two types of thermal management.

- **Thermal Monitor 1:** Thermal Monitor 1 uses a highly accurate on-die temperature sensing circuit in the CPU that has the ability to act quickly upon any thermal issues (~50ns). This circuitry keeps an eye on the most taxed areas of the CPU-die at all times and will quickly act upon temperatures going over the safety limits. The thermal monitor's control circuit, when active, lowers the CPU temperature by throttling

the internal CPU clock speed. This is done with a 50% duty-cycle, which means that a 2GHz CPU will then effectively run at a 1GHz clock speed. Due to the fast response time of the thermal monitor circuit (~50ns) the CPU will only be 'throttled' for a very brief period. Once the CPU-die temperature is within safe operating limits again it'll set back to the 2GHz clock speed it originally operated at.

- **Thermal Monitor 2:** Thermal Monitor 2 decreases or increases the CPU clock and core voltage according to the CPU load. This information is read from the five VID pins of the CPU. Accordingly, the CPU temperature is also automatically decreased, when the core voltage is decreased. This improves the CPU lifespan. The states switch is so fast that the performance decrease is insignificant.

TM2 Bus Ratio
It represents the frequency (bus ratio) of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot. (auto-detect)

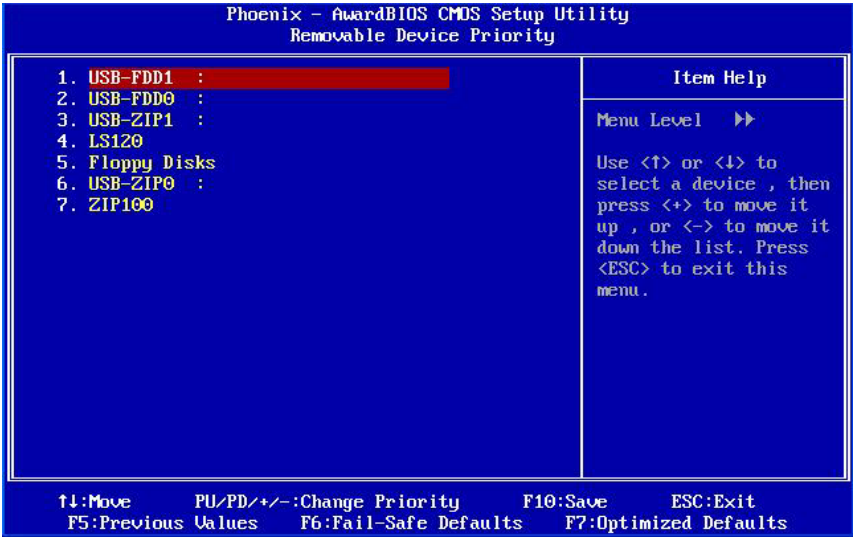
TM2 Bus VID
It represents the voltage of the throttled performance state that will be initiated when the on-die sensor goes from not hot to hot. (auto-detect)

CIE Function
Some processors implement an optimization of C1 (Halt Status) status called the Enhanced Halt State to further reduce the total power consumption while in C1.
• **Auto**
• Disabled

Execute Disable Bit
Intel's Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system. Execute Disable Bit allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation.
• **Enabled**
• Disabled

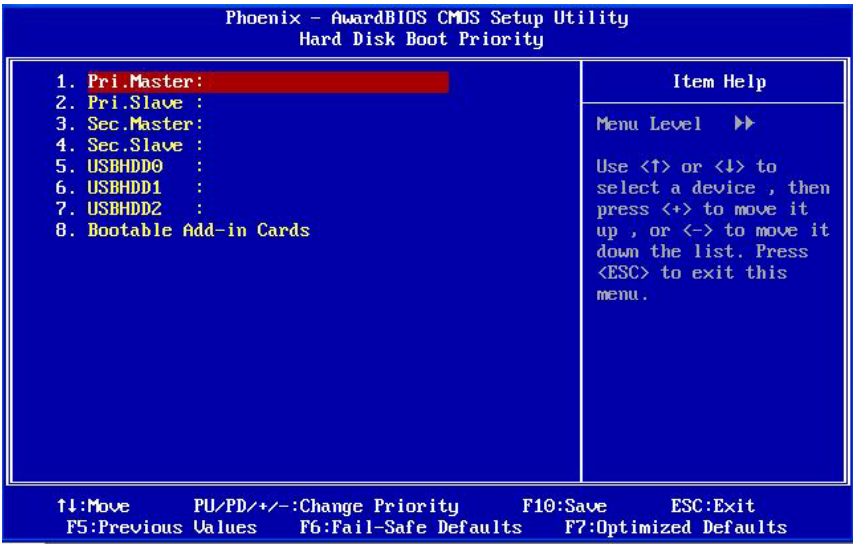
3.4.2 Removable Device Priority

This item allows you to select removable boot device priority.

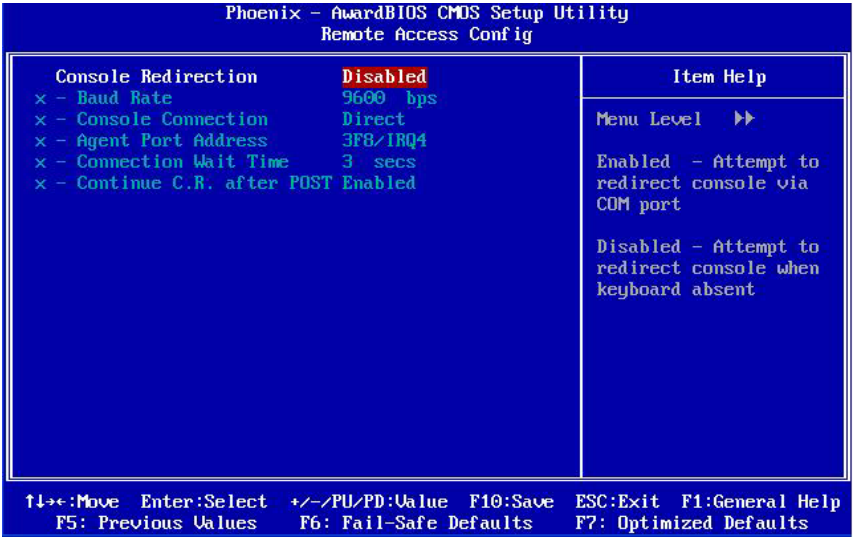


3.4.3 Hard Disk Boot Priority

This item allows you to select the hard disk boot priority.



3.4.4 Romote Access Config



Console Redirection
This option will redirect the BIOS and POST screens to the serial port to allow remote management using a terminal server.
• Enabled
• **Disabled**

Baud Rate
The Baud Rate is the transmission speed between two computers. The speed needs to be the same.
• 300
• 1200
• 2400
• 9600
• **19.2K**
• 38.4K
• 57.6K
• 115.2K

Console Connection
Indicate whether the console is connected directly to the system or a modem is used to connect.
• Via modem
• **Direct**

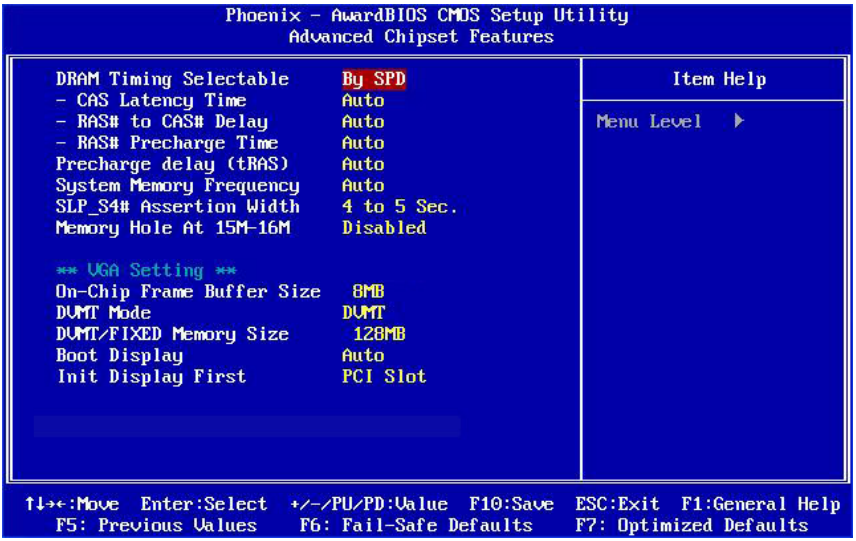
Agent Port Address
Specify which COM port address is used for Console Redirection.

Connection Wait Time
Specify the Timeout value for connection.

Continued C. R. after POST Enabled
Enable Console Redirection after OS has loaded.
• On
• **Off**

3.5 Advanced Chipset Features

In Advanced Chipset Features, you will be able to adjust many of the chipset special features.



DRAM Timing Selectable
This option permits you to either manually select memory timings, or allow the SPD (Serial Presence Detect) to determine the said timings automatically.
• Manual
• **By SPD**
Note: On all memory timing settings, lower number is more aggressive.

CAS Latency Time
This setting controls the time delay (in clock cycles - CLKs) that passes before the DRAM starts to carry out a read command after receiving it. This also determines the number of CLKs for the completion of the first part of a burst transfer. In other words, the lower the latency, the faster the transaction.
• **Auto**
• 2
• 2.5
• 3

DRAM RAS# to CAS# Delay
This setting is the number of cycles from when a bank activate command is issued until a read or write command is accepted, that is, before the CAS becomes active.
• **Auto**

• 5
• 4
• 3
• 2

DRAM RAS# Precharge Time
This setting is the number of cycles needed to return data to its original location to close the bank or number of cycles to page memory before the next bank activate command can be issued.
• **Auto**
• 5
• 4
• 3
• 2

Precharge Delay <tRAS>
This timing controls the length of the delay between the activation and precharge commands -- basically how long after activation can the access cycle be started again. This influences row activation time that is taken into account when memory has hit the last column in a specific row, or when an entirely different memory location is requested.
• **Auto**
• 4 ~ 10

System Memory Frequency
Changing this option allows the memory to be run asynchronously from the FSB but it is best if it is left at AUTO.
• **Auto**
• DDR333
• DDR400

SLP_S4# Assertion Width
Set minimum assertion width of the SLP_S4# signal to ensure that the DRAM s have been safely power-cycled.
• **4 to 5 sec.**
• 3 to 4 sec.
• 2 to 3 sec.
• 1 to 2 sec.

Memory Hole at 15M-16M
Certain ISA cards require exclusive access to the 1MB block of memory, from the 15th to the 16th megabyte, to work properly. This BIOS feature allows you to reserve that 1MB block of memory for such cards to use.
If you **enable** this feature, 1MB of memory (*the 15th MB*) will be reserved exclusively for the ISA card's use. This effectively reduces the total amount of memory available to the operating system by 1MB.
If you **disable** this feature, the 15th MB of RAM will not be reserved for the ISA

card's use. The full range of memory is therefore available for the operating system to use. However, if your ISA card requires the use of that memory area, it may then fail to work. Since ISA cards are a thing of the past, it is highly recommended that you **disable** this feature.
• **Disabled**
• Enabled

VGA Setting
On-Chip Frame Buffer Size
You may change the frame buffer size of on-board graphic chip.
• 1MB
• **8MB**

DVMT Mode (Dynamic Video Memory Technology)
This selection improves the efficiency of the memory allocated to either system or graphics processor.
When set to **Fixed Mode**, the graphics driver will reserve a fixed portion of the system memory as graphics memory. When set to **DVMT Mode**, the graphics chip will dynamically allocate system memory as graphics memory, according to system and graphics requirements.
When set to **Both Mode**, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.
• Fixed
• **DVMT**
• Both

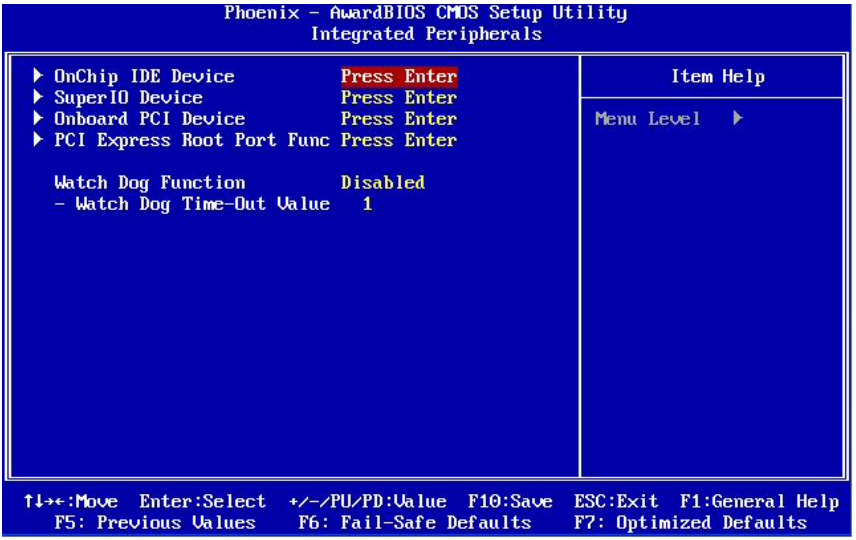
DVMT/Fixed Mode memory size
This selection decides the maximum amount of system memory for graphic chipset use.
• 64MB
• **128MB**
• 224MB

Boot Display
Select boot up display device.
• **Auto**
• CRT
• DFP

Init Display First
This selection decides the display from which graphic chipset.
• **PCI Slot**
• Onboard

3.6 Integrated Peripherals

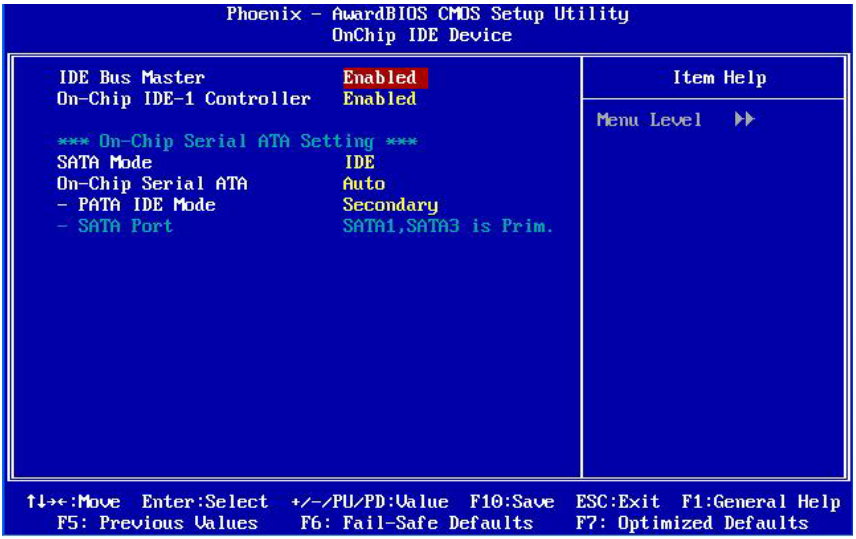
Options related to onboard peripheral features could be altered through the following:



Watch Dog Function
This option controls the function for Watch Dog.
• Disabled
• **Enabled/Sec.**
• Enabled/Min

Watch Dog Function Time-Out Value
Type in the Time-Out value for your Watch Dog function.
• **Sec. (1~255)**
• Min.(1-255)

3.6.1 OnChip IDE Device



IDE Bus Master

Choose IDE Bus Master **Enabled** can save the CPU resource when the IDE device transferring data to the memory.

On-Chip IDE-1 Controller

Enable or disable the onboard IDE-1 controller.

• **Enabled**
• Disabled

*****On-chip Serial ATA Setting*****

SATA Mode

This selects the mode for the SATA controller.

• **IDE**
• RAID
• AHCI

On-Chip Serial ATA

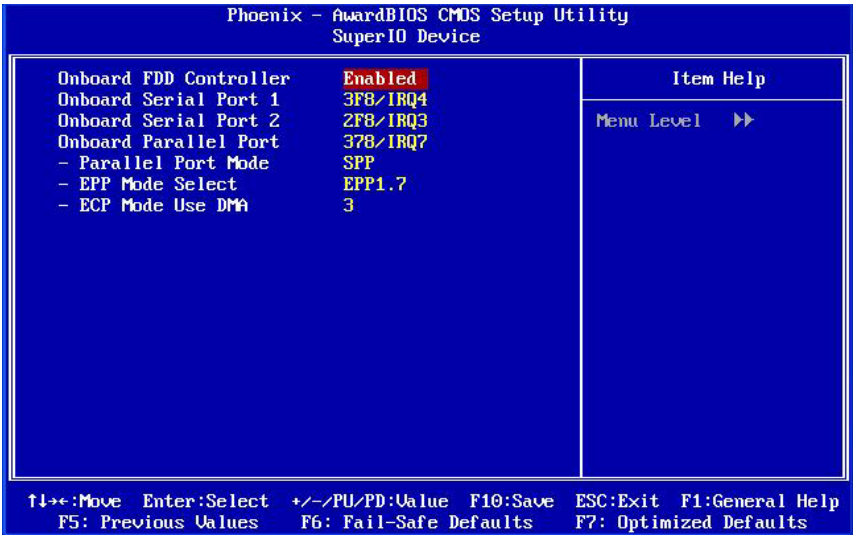
This selects the mode for the On-Chip Serial ATA controller. The following are the modes.

• Disabled: This disables the SATA controller.
• Auto: This auto selects the correct mode for the SATA controller.
• **Combined Mode**: This combines both PATA (Parallel ATA) and SATA. This allows a maximum of 2 IDE drives in each channel.
• Enhanced Mode: This enables both SATA as well as PATA and allows a maximum of 6 IDE drives in each channel.
• SATA Only: This operates SATA in legacy mode.

PATA IDE Mode
This selects the mode for the PATA controller.
[Primary] IDE is Primary Channel (IDE channel1). Secondary Channel (IDE channel2) master is SATA2 and Slave is SATA4.
[**Secondary**] IDE is Secondary Channel (IDE channel2). Primary Channel (IDE channel1) master is SATA1 and slave is SATA3.

SATA Port
This item is read only.

3.6.2 Super IO Device



Onboard FDC Controller
Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select “Disabled” in the field.
• **Enabled**
• Disabled

Onboard Serial Port 1/2
Select an address and corresponding interrupt for the first or second serial port.
• **3F8/IRQ4**
• **2F8/IRQ3**
• 3E8/IRQ4
• 2E8/IRQ3
• Auto

Onboard Parallel Port
To use the parallel port on the system, select an address and corresponding interrupt for the parallel port.
• **378/IRQ7**
• 278/IRQ5
• 3BC/IRQ7
• Disabled

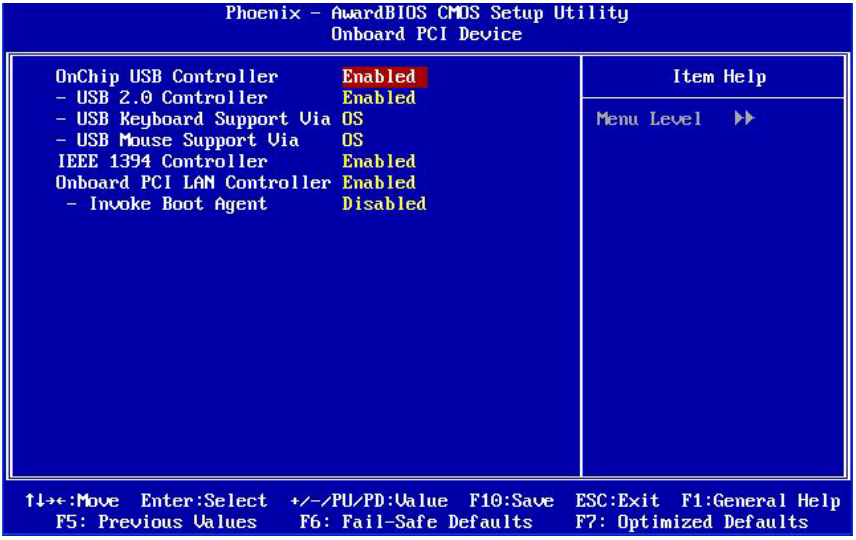
Parallel Port Mode
This field allows the user to select the parallel port mode. The default value is SPP that automatically selects the correct mode to use. The other modes are explained as follows:
SPP works with all parallel port devices. However, it is the slowest transfer mode and should only be used when faster transfer modes cannot be used.
There are two faster bidirectional modes available - the ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) modes.
ECP uses the DMA protocol to achieve data transfer rates of up to 2.5Mbytes/s and provides symmetric bidirectional communication. On the other hand, EPP uses existing parallel port signals to provide asymmetric bidirectional communication.
For those who don't know what mode to select but at least know that their parallel port device supports bidirectional transfers, the BIOS offers the ECP+EPP mode. If you select this mode, then the parallel port device will be able to use either one of those modes. However, this should be considered as a last resort as you may be needlessly tying up an IRQ for nothing if your device does not use ECP at all. Or, the BIOS may not select the best parallel port mode for the device. If possible, set the parallel port to the transfer mode that best suits your parallel port device.
• **SPP**
• EPP
• ECP
• ECP + EPP

EPP Mode Select
There are two versions of the EPP transfer protocol - EPP1.7 and EPP1.9. Generally, EPP1.9 is the preferred setting because it supports the newer EPP1.9 devices and most EPP1.7 devices; and offers advantages like support for longer cables. However, because certain EPP1.7 devices cannot work properly with an EPP1.9 port, this BIOS feature was implemented to allow you to set the EPP mode to EPP1.7 when such an issue occurs.
Therefore, it is recommended that you set this BIOS feature to EPP1.9. But if you have trouble connecting to your parallel port device, switch to EPP1.7.
• **EPP1.7**
• EPP1.9

ECP Mode Use DMA
This BIOS feature determines which DMA channel the parallel port should use

when it is in ECP mode.
Please note that there is no performance advantage in choosing DMA Channel 3 over DMA Channel 1 or vice versa. As long as either Channel 3 or Channel 1 is available for your parallel port to use, the parallel port will be able to function properly in ECP mode.
• **3**
• 1

3.6.3 Onboard PCI Device



OnChip USB Controller
This option enables or disables IRQ allocation for the USB (Universal Serial Bus) controller.
Enable this if you are using a USB device. If you disable this while using a USB device, you may have problems running that device. However, if you don't use any USB devices, set the option to Disabled. It will free up an IRQ for other devices to use.
• **Enabled**
• Disabled
Note: This option is for the older USB 1.1 specification

USB 2.0 Controller
This option enables or disables IRQ allocation for the USB 2 (Universal Serial Bus -Specification 2.0) controller. Enable this if you are using a USB 2 device. If you disable this while using a USB 2 device, you may have problems running that device. However, if you don't use any USB 2 devices, set the option to

Disabled. It will free up an IRQ for other devices to use.
• **Enabled**
• Disabled
Note: USB 2.0 has a throughput of 480 Mbps (40 times faster than USB 1.1) and is fully backward compatible with USB 1.1.

USB Keyboard Support via
You may choose when to have USB keyboard support, via OS or BIOS.
• **OS**
• BIOS

USB Mouse Support via
You may choose when to have USB mouse support, via OS or BIOS
• **OS**
• BIOS

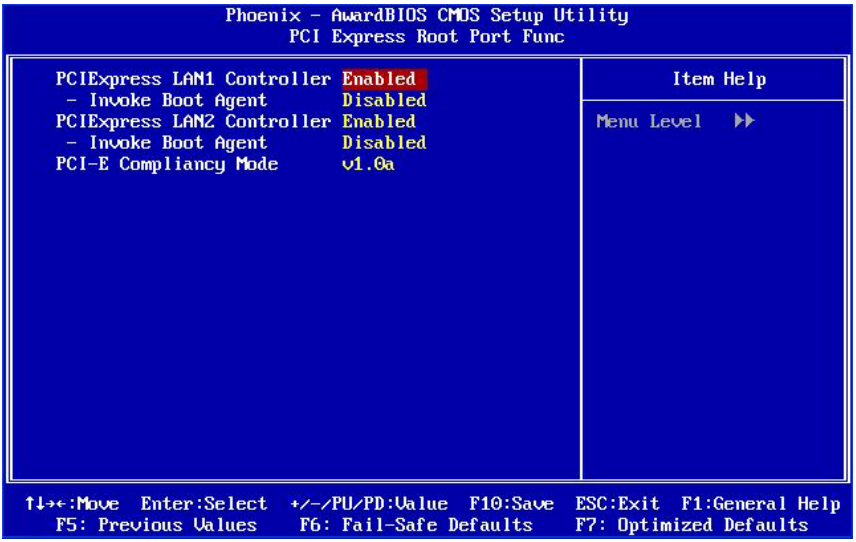
IEEE 1394 Controller
This enables/disables the onboard 1394 (FireWire) controller. Disabling this will disable access to any connected FireWire devices.
• **Enabled**
• Disabled

Onboard PCI LAN Controller
This controls if the onboard Lan will is run on boot up. Lan Boot ROMs are used to download operating system code from a network server. Options are:
• **Enabled**
• Disabled

Invoke Boot Agent
• **Enabled**
• Disabled

3.6.4 PCI Express Root Port Function

This option enables the BIOS to detect the PCI devices attached to the four PCI Express ports.



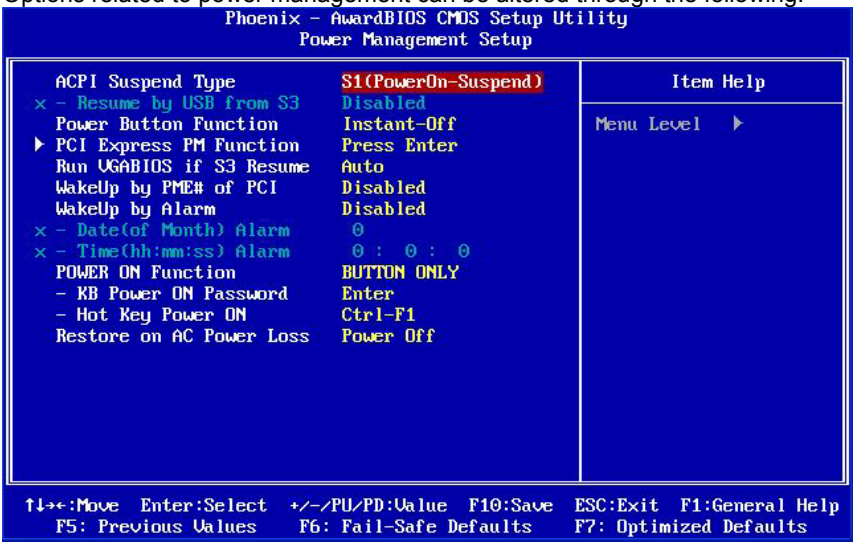
PCI Express LAN1/LAN2 Controller
When enabled, the BIOS check these ports to detect and activate the PCI devices connected to them.
• **Enabled**
• Disabled

Invoke Boot Agent
• **Enabled**
• Disabled

PCI-E Compliancy Mode
This BIOS option determines compatibility between PCI-Express specification v1.0 and PCIExpress specification v1.0a.
• **V1.0a**
• V1.0

3.7 Power Management Setup

Options related to power management can be altered through the following:



ACPI Suspend Type
This item selects the type of Suspend mode.
[S1 (PowerOn-Suspend)]: Enables the Power On Suspend function.
[S3 (Suspend-To-RAM)]: Enables the Suspend to RAM function.
• **S1(PowerOn-Suspend)**
• S3 (Suspend-To-RAM)

Resume by USB from S3
When set to [Enabled], this item allows you to use a USB device to wake up a system that is in the S3 (STR - Suspend To RAM) state. This item can be configured only if the item “ACPI Suspend Type” is set to [S3(STR)].
• **Disabled**
• Enabled

Power Button Function
This is to select the delay time when you push power button.
• **Delay 4 Sec**
• Instant Off

Run VGABIOS if S3 Resume
Selects whether to run the VGA BIOS if resumed from S3 state. This is only necessary for older VGA drivers. Select Auto, if in doubt.
• **Auto**
• Yes
• No

Note: This option is enabled only if S3 or S1 & S3 is selected from the ACPI Suspend Type option.

WakeUp by PME# of PCI
When set to [Enabled], access to the PCI card will cause the system to wake up. The PCI card must support the wake up function
• **Disabled**
• Enabled

WakeUp by Alarm
When set to [**Enabled**], you can set the date and time you would like the Soft-Off PC to power-on in the "**Date (of Month) Alarm**" and "**Time (hh:mm:ss) Alarm**" items. However, if the system is being accessed by incoming calls or the network (Resume On Ring/LAN) prior to the date and time set in these items, the system will give priority to the incoming calls or network instead.
• **Disabled**
• Enabled

Date (of Month) Alarm
[0]: This option power-on the system everyday according to the time set in the "Time (hh:mm:ss) Alarm" item.
[1-31]: This option selects a date you would like the system to power-on. The system will power-on on the date set, and the time set in the "Time (hh:mm:ss) Alarm" item.
• **0**
• 31

Time (hh:mm:ss) Alarm
This item sets the time you would like the system to power-on.

Power on Function
This option defines how the system can be waked up from the sleep mode.
• **Button only**
• Keyboard + BTN
• KB + mouse + BTN
• Mouse + BTN

KB Power ON Password
Type in your password for KB to power on the system.

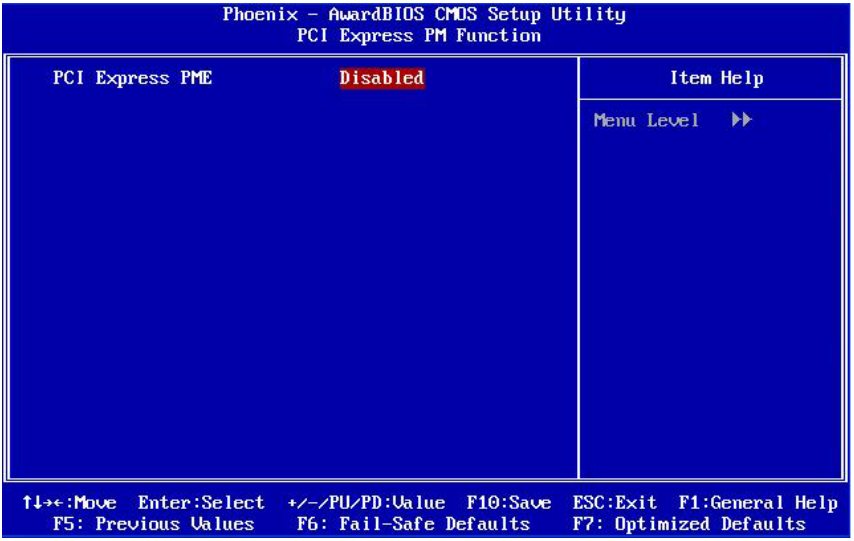
Hot Key Power ON
Set the hot key to power on the system.

Restore On AC Power Loss
This item selects the system action after an AC power failure.
[Power Off]: When power returns after an AC power failure, the system's power remains off. You must press the Power button to power-on the system.

[Power On]: When power returns after an AC power failure, the system's power will be powered on automatically.
[Last State]: When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power on when power returns.
• **Power Off**
• Power On
• Last State

3.7.1 PCI Express PM Function

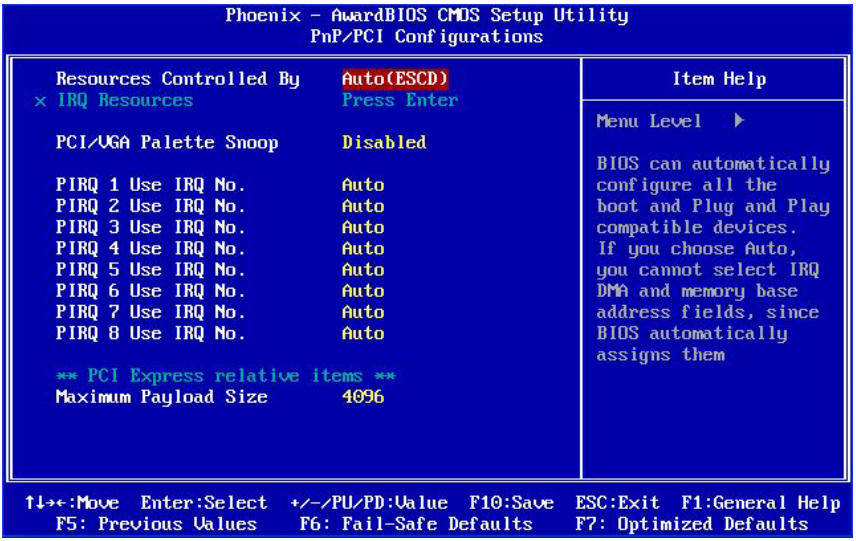
PCI Express components are permitted to wakeup the system using a wakeup mechanism followed by a power management event (PME) Message. PCI Express systems may provide the optional auxiliary power supply (Vaux) needed for wakeup operation from states where the main power supplies are off. PCI Express-PM extends beyond the PME mechanism defined in conventional PCI-PM as PCI Express PME Messages include the Requestor ID of the requesting agent. These PME Messages are in-band TLPs routed from the requesting device towards the Root Complex.



PCI Express PME
This option performs the same function as Wake-Up by PCI card, but is for PCI-Express cards.
• **Enabled**
• Disabled

3.8 PnP/PCI Configurations

This section allows configuring PnP / PCI resources.



Resources Controlled By
When this option is set to AUTO, the BIOS by using ESCD, controls the IRQ and DMA assignments of all of the boot and PNP devices in the system. If you set this option to Manual, you will be able to manually assign all IRQ and DMA information.
• **Auto (ESCD)**
• Manual

IRQ Resources
This option is used to manually assign IRQ resources.

PCI/VGA Palette Snoop
This option is only useful if you use an MPEG card or an add-on card that makes use of the graphics card's Feature Connector.
• **Disabled**
• Enabled

PIRQ 1~8 Use IRQ No.
This item specifies the IRQ number manually or automatically for the devices installed on PCI slots.
• **Auto**
• Manual

PCI Express relative items

Maximum Payload Size

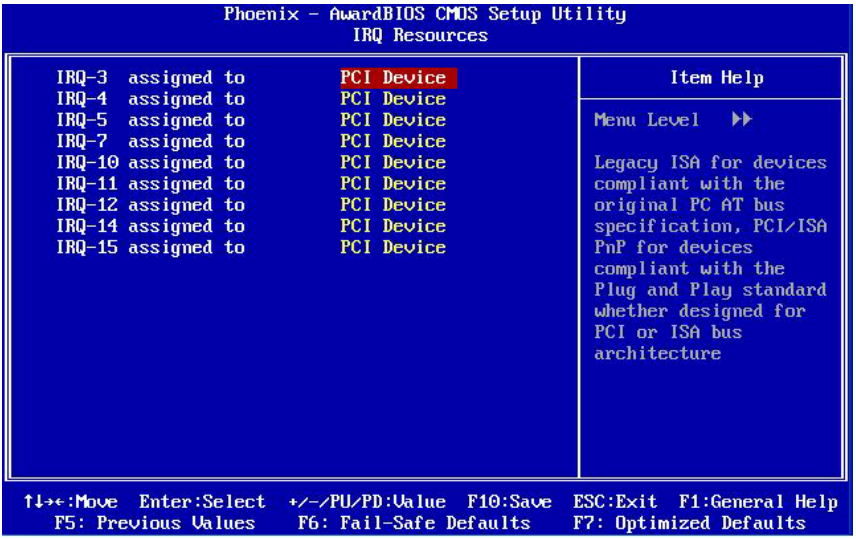
This setting defines the maximum payload size.

- 128
- 256
- 512
- 1024
- 2048
- **4096**

This controls the maximum amount of data that can be transferred in a packet. Larger payload sizes increase data throughput, but increase the time that an application must wait for data to begin being transferred.

3.8.1 IRQ Resources

This option is used to manually assign IRQ resources.



Note: This option is enabled only if the Resources Controlled By is set to [Manual].

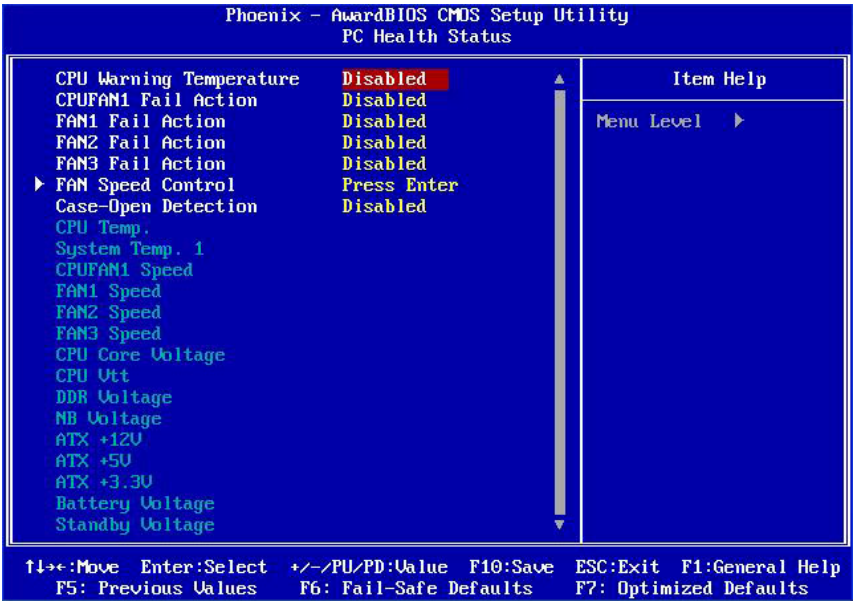
IRQ -(3,4,5,7,9,10,11,12,14,15) assigned to

This specifies whether these IRQs are assigned to any PCI Devices or are Reserved (Not Used).

- **PCI Device**
- Reserved

3.9 PC Health Status

This section monitors critical parameters of your PC and can automatically shutdown the PC if the temperature of the processor exceeds the specified threshold value. This is only available if there is a Hardware Monitor onboard.



Note: The onboard Winbond 83627EHG hardware monitoring ASIC automatically detects the system, motherboard and CPU temperature. It detects the CPU and chassis fan speeds in RPM. The hardware monitor ASIC also detects the voltage output through the voltage regulators.

CPU Warning Temperature
BEEP output control for CPU temperature if the monitor value exceed the limit value.

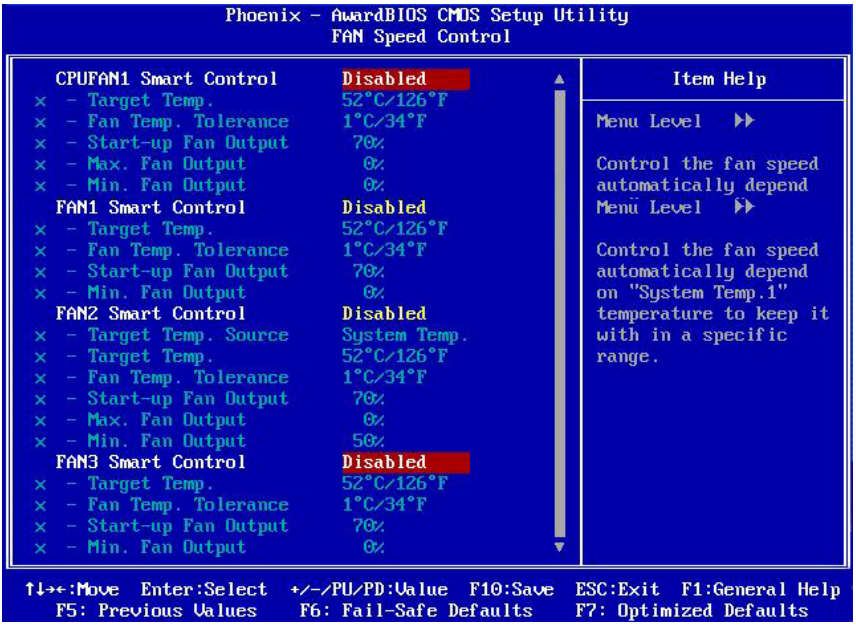
- Disabled
- 50
- 55
- 60
- 65
- 70
- 75
- **80**
- 85
- 90
- 95

CPUFAN1/FAN1/2/3 Fail Action
Shutdown the system or warning beep which the onboard CPUFAN1 / FAN1 / FAN2 / FAN3 stop working be detected. NOTE: Shutdown procedure only works in ACPI OS.
• **Disabled**
• Warning Beep
• Shutdown System

Case-Open Detection
Enable/Disable: when chassis open event is detected, BIOS will record the event.
• Enabled
• **Disabled**

3.9.1 Fan Speed Control

This section controls the fan settings.



CPUFAN1/FAN1/FAN2/FAN3 Smart Ctrl.
Smart control for onboard FAN connectors. Target Temp. reference to CPU Temperature.
• **Disabled**
• Enabled

Target Temp.
If current temp. > Target Temp. + Tolerance, increase fan speed. If current temp. < Target Temp. – Tolerance, decrease fan speed.

Fan Temp. Tolerance
If current temp. > Target Temp. + Tolerance, increase fan speed. If current temp. < Target Temp. – Tolerance, decrease fan speed.

Start-up Fan Output
FAN Speed will increase from 0 to this value to provide a minimum value to turn on the fan.
• **Disabled**
• Enabled

Max. Fan Output
When at SMART FANTM III mode, Fan Speed will increase to this value.

Min. Fan Output
If the temp. keeps below low limit, then the fan speed keeps on decreasing until Stop Value.

3.10 Load Fail-Safe Defaults
This option loads the BIOS default values for the most stable, minimal-performance system operations.

3.11 Load Optimized Defaults
This option loads the BIOS default values that are factory settings for optimal-performance system operations.

3.12 Set Password
This option protects the BIOS configuration or restricts access to the computer itself.

3.13 Save & Exit Setup
This option saves your selections and exits the setup menu.

3.14 Exit Without Saving
This option exits the setup menu without saving any change.

NOTE

Chapter 4: Diagnostics

NOTE: If you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN website at: http://www.tyan.com.

4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.
•A single long beep followed by two short beeps: It indicates that a video error has occurred and the BIOS can't initialize the video screen to display and additional info.
•A single long beep repeatedly: This indicates that a DRAM error has occurred.
The most common type of error is a memory error.

Before contacting your vendor or TYAN Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN web site: http://www.tyan.com/

Note

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN be held responsible for damages done by the end user.

4.3 - BIOS Post Code

BootBlock POST Code List :

Post Code (Port 80)	Mnemonic	Post Routine Description
80H	TP_BB_CS_INIT	Initializes the host PCI device.
81H	TP_BB_BRIDGE_INIT	Initializes the SMB support.
82H	TP_BB_CPU_INIT	Initializes the CPU if needed.
83H	TP_BB_TIMER_INIT	Initializes timer.
84H	TP_BB_IO_INIT	Configures I/O floppy and LPT port.
85H	TP_BB_FORCE	Checks for a forced flash.
86H	TP_BB_CHKSUM	Check BIOS checksum.
87H	TP_BB_GOTOBIOS	Transition from Boot Block to the system BIOS.
88H	TP_BB_MP_INIT	Initializes multi-processors.
89H	TP_BB_SET_HUGE	Sets huge (4GB) segment for DS, ES, FS and GS.
8AH	TP_BB_OEM_INIT	OEM special initialization. (Null)
8BH	TP_BB_HW_INIT	Initializes PIC and DMA controller.
8CH	TP_BB_MEM_TYPE	Initializes memory type.
8DH	TP_BB_MEM_SIZE	Initializes memory size.
8EH	TP_BB_SHADOW	Shadows the Boot Block.
8FH	TP_BB_SMM_INIT	Initializes SMM. (Null)
90H	TP_BB_RAMTEST	Tests the first 640KB of RAM.
91H	TP_BB_VECS_INIT	Initializes the interrupt vector area.
92H	TP_BB_RTC_INIT	Initializes RTC. (Null)
93H	TP_BB_VIDEO_INIT	Initializes Video. (Null)
94H	TP_BB_OUT_INIT	Initializes the output devices.
95H	TP_BB_BOOT_INIT	Initializes the boot devices.
96H	TP_BB_CLEAR_HUGE	Resets the segment to 64KB
97H	TP_BB_BOOT_OS	Begins booting to the crisis diskette.
98H	TP_BB_USB_INIT	Enables USB devices.
99H	TP_BB_SECUR_INIT	Initializes security. (Null)

Main BIOS POST Code List :

Post Code (Port 80)	Mnemonic	Post Routine Description
01H	TP_IPMI_INIT	Initializes the IPMI interface and check BMC status. (Optional)
02H	TP_VERIFY_REAL	Verifies if the CPU is in real mode from cold start.
03H	TP_DISABLE_NMI	Disables NMIs.
04H	TP_GET_CPU_TYPE	Gets CPU Type.
06H	TP_HW_INIT	Miscellaneous hardware initialization.
07H	TP_CS_BIOS_DESHAD	Disables system ROM shadow and start to execute ROMEXEC code from the flash part. (Optional)
08H	TP_CS_INIT	Initializes chipset registers to power-on defaults.
09H	TP_SET_IN_POST	Sets InPostBit in CMOS.
0AH	TP_CPU_INIT	Initializes CPU registers.
0BH	TP_CPU_CACHE_ON	Enables L1 cache during POST.
0CH	TP_CACHE_INIT	Initializes cache(s).
0EH	TP_IO_INIT	Initializes I/O component. (Optional)
0FH	TP_FDISK_INIT	Disables IDE operation.
10H	TP_PM_INIT	(Optional)
11H	TP_REG_INIT	General dispatcher for alternate register initializations. (Optional)
12H	TP_RESTORE_CR0	Restores CR0 after CPU is reset.
13H	TP_PCI_BM_RESET	Resets PCI devices to disable bus master in early post. (Optional)
14H	TP_8742_INIT	Initializes and configures the keyboard controller.
16H	TP_CHECKSUM	Verifies ROM BIOS checksum.
17H	TP_PRE_SIZE_RAM	Initializes external cache before memory auto-sizing. (Optional)
18H	TP_TIMER_INIT	Initializes the times.
1AH	TP_DMA_INIT	Tests the DMA registers.
1CH	TP_RESET_PIC	Initializes interrupt controllers for some shutdowns.
20H	TP_REFRESH	Verifies DRAM refresh.
22H	TP_8742_TEST	Report if there was a keyboard controller failure.
24H	TP_SET_HUGE_ES	Makes huge (4GB) segments for DS, ES, FS, GS, SS.
26H	TP_ENABLE_A20	(Optional)
28H	TP_SIZE_RAM	Determines DRAM size and configure the chipset accordingly.
29H	TP_PMM_INIT	Initializes the POST Memory Manager.
2AH	TP_ZERO_BASE	Zeros the RAM up to minimum RAM specified in the chipset RAM table.
2BH	TP_ENH_CMOS_INIT	(Optional)
2CH	TP_ADDR_TEST	Tests address lines of the RAM.
2EH	TP_BASERAML	Tests the first 4MB of RAM.

2FH	TP_PRE_SYS_SHADOW	Initializes external cache before shadowing. (Optional)
30H	TP_BASERAMH	(Optional)
32H	TP_COMPUTE_SPEED	Computes CPU clock speed in MHz.
33H	TP_PDM_INIT	Initializes the Phoenix Dispatch Manager.
34H	TP_CMOS_TEST	(Optional)
36H	TP_CHK_SHUTDOWN	Vector to proper shutdown routine.
38H	TP_SYS_SHADOW	Shadows the system BIOS.
3AH	TP_CACHE_AUTO	Sizes the external cache.
3BH	TP_DBGSRV_INIT	(Optional)
3CH	TP_ADV_CS_CONFIG	Advanced chipset configuration.
3DH	TP_ADV_REG_CONFIG	General dispatcher for alternate register. (Optional)
3FH	TP_ROMPILOT_MEMORY	(Optional)
41H	TP_ROMPILOT_INIT	(Optional)
42H	TP_VECTOR_INIT	Initializes interrupt vectors.
45H	TP_DEVICE_INIT	POST device initialization routine. (Optional)
46H	TP_COPYRIGHT	Verifies that the copyright message is intact.
48H	TP_CONFIG	Verifies the hardware configuration and note whether we have color or monochrome mode.
49H	TP_PCI_INIT	Initializes PNP and PCI.
4AH	TP_VIDEO	Initializes the video.
4BH	TP_QUIETBOOT_START	(Optional)
4CH	TP_VID_SHADOW	Shadows the video BIOS.
4EH	TP_CR_DISPLAY	Displays the copyright message.
4FH	TP_MULTBOOT_INIT	Allocates storage for the old and new history tables. (Optional)
50H	TP_CPU_DISPLAY	Displays CPU type and speed.
51H	TP_EISA_INIT	(Optioanl)
52H	TP_KB_TEST	Initializes and configures the keyboard and PS/2 mouse.
54H	TP_KEY_CLICK	(Optional)
55H	TP_USB_INIT	Configures USB devices. (Optional)
56H	TP_ENABLE_KB	(Optional)
57H	TP_1394_INIT	(Optional)
58H	TP_HOT_INT	Tests for hot (unexpected) interrupts.
59H	TP_PDS_INIT	Initializes the POST display services. (Optional)
5AH	TP_DISPLAY_F2	Displays “Press F2 for Setup” prompt and enables the keyboard interrupt.
5BH	TP_CPU_CACHE_OFF	Disables CPU cache.
5CH	TP_MEMORY_TEST	Sizes conventional memory, stores the amount and prints this to the screen.
5EH	TP_BASE_ADDR	(Optional)
60H	TP_EXT_MEMORY	Performs memory tests on extended RAM.
62H	TP_EXT_ADDR	Performs address tests on extended RAM.
64H	TP_USERPATCH1	Jump to UserPatch1.
66H	TP_CACHE_ADVNCD	Configures advanced cache features.

67H	TP_MP_INIT_MIN	Quick initializes of all AP's in early post. (Optional)
68H	TP_CACHE_CONFIG	Enables cache(s).
69H	TP_PM_SETUP_SMM	Performs SMM initializations. (Optional)
6AH	TP_DISP_CACHE	Displays cache RAM size if desired.
6BH	TP_CUST_DFLT	(Optional)
6CH	TP_DISP_SHADOWS	Displays BIOS shadow status.
70H	TP_ERROR_MSGS	Displays any errors found.
72H	TP_TEST_CONFIG	Checks for bad configurations.
74H	TP_RTC_TEST	(Optional)
76H	TP_KEYBOARD	Reports if there was a keyboard or controller failure.
7AH	TP_KEYLOCK	(Optional)
7CH	TP_HW_INTS	Initializes hardware interrupt vectors.
7DH	TP_ISM_INIT	(Optional)
7EH	TP_COPROC	Tests for coprocessor.
80H	TP_IO_BEFORE	(Optional)
81H	TP_LATE_DEVICE_INIT	POST device initialization routine. (Optional)
82H	TP_RS232	(Optional)
83H	TP_FDISK_CFG_IDE	Configures Non-MCD IDE controllers.
84H	TP_LPT	(Optional)
85H	TP_PCI_PCC	Configures PnP PCC devices. (Optional)
86H	TP_IO_AFTER	(Optional)
87H	TP_MCD_INIT	Configures MCD devices.
88H	TP_BIOS_INIT	Initializes timeouts, key buffer, soft reset flag.
89H	TP_ENABLE_NMI	Enable NMIs.
8AH	TP_INIT_EXT_BDA	Initializes extended BIOS data area.
8BH	TP_MOUSE	Checks if mouse is installed, displays "Installed" message. (Optional)
8CH	TP_FLOPPY	POST task for installing and initializing legacy floppy disk drives.
8EH	TP_AUTOTYPE	(Optional)
8FH	TP_FDISK_FAST_PREINIT	(Optional)
90H	TP_FDISK	Tests hard disks.
91H	TP_FDISK_FAST_INIT	Programs timing registers according to PIO modes. (Optional)
92H	TP_USERPATCH2	Jump to UserPatch2.
93H	TP_MP_INIT	Creates the MP table. (Optional)
95H	TP_CD	Installs CD-ROM for boot. (Optional)
96H	TP_CLEAR_HUGE_ES	Performs a shutdown eight to transition from the warm start table to the cold start table. (Optional)
97H	TP_MP_FIXUP	Fix-up MP table physical pointer and checksum. (Optional)
98H	TP_ROM_SCAN	Configures Non-PCC PnP ISA devices, PCI IRQs, enables PCI devices and rom scan.
99H	TP_FDISK_CHECK_SMART	POST task to check SMART status. (Optional)
9AH	TP_MISC_SHADOW	(Optional)

9BH	TP_PMCPUSPEED	(Optional)
9CH	TP_PM_SETUP	Late SMM initialization. (Optional)
9DH	TP_SECURITY_INIT	Initializes the system security engine. (Optional)
9EH	TP_IRQS	Enables the proper hardware interrupts.
9FH	TP_FDISK_FAST_INIT2	(Optional)
A0H	TP_TIME_OF_DAY	Sets time of day.
A2H	TP_KEYLOCK_TEST	Tests if key-lock or keyboard controller password is on. (Optional)
A4H	TP_KEY_RATE	(Optional)
A8H	TP_ERASE_F2	Removes “Press F2” prompt from the screen.
AAH	TP_SCAN_FOR_F2	Checks if user has requested SETUP.
ACH	TP_SETUP_CHECK	Checks to see if SETUP should be executed.
AEH	TP_CLEAR_BOOT	Clears ConfigFailedBit and InPostBit in CMOS.
B0H	TP_ERROR_CHECK	Checks for POST errors.
B1H	TP_ROMPILOT_UNLOAD	(Optional)
B2H	TP_POST_DONE	Sets/clears status bits to reflect POST is completed.
B3H	TP_ENH_CMOS_STORE	Stores enhanced CMOS values in Non-volatile area. (Optional)
B4H	TP_ONE_BEEP	(Optional)
B5H	TP_QUIETBOOT_END	(Optional)
B6H	TP_PASSWORD	Queries for password before boot. (Optional)
B7H	TP_ACPI	Setups ACPI table in shadow RAM and in extended memory. (Optional)
B8H	TP_SYSEM_INIT	(Optional)
B9H	TP_PREPARE_BOOT	Cleans up all graphics before booting.
BAH	TP_DMI	Executes DMI handlers. (Optional)
BBH	TP_INIT_BCVS	(Optional)
BCH	TP_PARITY	Clears the parity error latch, set correct NMI state.
BDH	TP_BOOT_MENU	Displays boot first menu. (Optional)
BEH	TP_CLEAR_SCREEN	Clears the screen.
BFH	TP_CHK_RMDR	Checks the reminder features. (Optional)
C0H	TP_INT19	Cleans up the system and boots via INT 19h.
C1H	TP_PEM_INIT	Invokes via shutdown table to initialize PEM data structure.
C1H	TP_CHKBOOTTYPE	(Optional)
C2H	TP_PEM_LOG	Invokes the error logging function of all registered error handlers.
C2H	TP_SAVEBOOTTYPE	Saves the current boot type into CMOS.
C3H	TP_PEM_DISPLAY	Scans the PEMRegTbl and calls the display function for each registered error handler in the same order as they were registered with the PEM.
C3H	TP_CHKREQBOOTTYPE	Determines if a specific boot type has been

		requested.
C4H	TP_PEM_SYSER_INIT	Initializes (clears) the system error flags. (Optional)
C4H	TP_HOTKEY_START	Installs the IRQ1 vector. (Optional)
C5H	TP_DUAL_CMOS	(Optional)
C5H	TP_HOTKEY_END	Marks the fact that we are no longer in POST. (Optional)
C6H	TP_DOCK_INIT	(Optional)
C6H	TP_CONSOLE_INIT	Installs console before any text output, if requested. (Optional)
C7H	TP_DOCK_INIT_LATE	(Optional)
C7H	TP_CONSOLE_COMPORT	Removes display manager and INT 10h hook. (Optional)
C8H	TP_FORCE	Forces check. (Optional)
C8H	TP_A20_TEST	Performs A20 test. (Optional)
C9H	TP_EXT_CHECKSUM	Checks (and do) if flash recovery is necessary.
C9H	TP_EISA_BEFORE_INIT	(Optional)
CAH	TP_SERIAL_KEY	(Optional)
CAH	TP_EISA_AFTER_INIT	(Optional)
CBH	TP_ROMRAM	(Optional)
CBH	TP_SAVE_MEMCFG	(Optional)
CCH	TP_SERIAL_VID	(Optional)
CCH	TP_RESTORE_MEMCFG	(Optional)
CDH	TP_PCMATA	(Optional)
CDH	TP_CONSOLE_VECTOR	Reclaims console vector after H/W vectors are initialized. (Optional)
CEH	TP_PEN_INIT	(Optional)
CEH	TP_ERRLOG_INIT	(Optional)
CFH	TP_XBDA_FAIL	Extended BIOS data area allocating failure.
CFH	TP_ERRLOG_MSG	(Optional)
D1H	TP_BIOS_STACK_INIT	Initializes BIOS stack during POST. (Optional)
D2H	TP_UNKNOWN_INT	Unknown interrupt.
D3H	TP_SETUP_WAD	Finds space for memory wad and zeros it.
D4H	TP_CPU_GET_STRING	Gets CPU brand string. (Optional)
D5H	TP_SWITCH_POST_TABLES	(Optional)
D6H	TP_PCCARD_INIT	(Optional)
D7H	TP_FIRSTWARE_CHECK	(Optional)
D8H	TP_ASF_INIT	(Optional)
D9H	TP_IPMI_INIT_LATE	Performs any IPMI initialization in late post. (Optional)
DAH	TP_PCIE_INIT	Initializes PCI-E devices. (Optional)
DBH	TP_SROM_TEST	(Optional)
DCH	TP_UPD_ERROR	Registers with the error manager and reports error. (Optional)
DDH	TP_REMOTE_FLASH	(Optional)
DEH	TP_UNDI_INIT	(Optional)
DFH	TP_UNDI_SHUTDOWN	(Optional)

Note: Items in red means an empty routine with POST code only.

NOTE

Appendix: How to Make a Driver Diskette

Follow the steps below to make a driver diskette from the TYAN driver CD provided

1. Insert the Driver CD into the CD-ROM drive and copy the RAID driver from \drivers\Windows\RAID\ESB RIAD Driver 6.075.2.3\ to the floppy disk in another Windows system

2. Insert the floppy disk to the original system and install the RAID driver

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs at only 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path, can carry. Greater bandwidth, then, also results in greater speed.

BBS (BIOS Boot Specification): is a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails for some reason. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, and provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data, usually from an application, though it is also used when printing, and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it, all at once, to a disk drive. While this improves system performance --- reading to or writing from a disk drive a single time is much faster than doing so repeatedly --- there is also the possibility of losing your data should the system crash. Information stored in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times, since the needed information is stored in the SRAM instead of in the slow DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Cache size: refers to the physical size of the cache onboard. This should not be confused with the cacheable area, which is the total amount of memory which can be scanned by the system in search of data to put into the cache. A typical setup would be a cache size of 512KB, and a cacheable area of 512MB. In this case, up to 512KB of the main memory onboard is capable of being cached. However, only 512KB of this memory will be in the cache at any given moment. Any main memory above 512MB could never be cached.

Closed and open jumpers: jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): is a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM sockets, because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other

tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

Doze mode: in this mode, only the CPU's speed is slowed.
DRAM (Dynamic RAM): widely available, very affordable form of RAM which has the unfortunate tendency to lose data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN's BIOS updates can be found at http://www.tyan.com

EMRL: Embedded RAID Logic. An Adaptec specific RAID technology.

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Fault-tolerance: a term describing a system where one component can quickly be replaced without causing a loss of service, such as in a RAID system.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX, although TYAN also makes some Baby-AT and ATX Footprint boards.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

Handshaking: a process where two devices initiate communications. One device, typically the server, sends a message to another device, typically a client, in order to request establishment of a communications channel. The two devices will then exchange messages back and forth in order to settle on a communications protocol.

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I**/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

Initial Program Load (IPL): a feature built into BBS-compliant devices, describing those devices as capable of loading and executing an OS, as well as being able to provide control back to the BIOS if the loading attempt fails.

IPL: see Initial Program Load.

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

ISA (Industry Standard Architecture): a slower 8- or 16-bit bus (data pathway).

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This is most common when the system sends data out to a peripheral device, and it waiting for the peripheral to send some data back (peripherals tend to be slower than onboard system components).

Mirroring: see RAID.

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

OEMs (Original Equipment Manufacturers): Compaq or IBM package other companies' motherboards and hardware inside their case and sell them.

Parallel port: transmits the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.
PCI-to-PCI bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a type of RAM that can maintain it's data as long as power is provided to the memory chips. In this configuration, SRAM requests are pipelined, which means that larger packets of data are sent to the memory at one time, and acted upon quickly. This type of SRAM operates at bus speeds higher than 66MHz.

Pipelining: improves system performance by allowing the CPU to begin executing a second instruction before the first is completed. A pipeline can be likened to an assembly line, with a given part of the pipeline repeatedly executing a set part of an operation on a series of instructions.

PM timers (Power Management timers): software timers that count down the number of seconds or minutes until the system times out and enters sleep, suspend, or doze mode.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Novice end users can simply plug them into a computer that is running on a Plug-n-Play aware operating system (such as Windows 98), and go to work. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was designed to define a standard set of preboot protocol services within a client, towards the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly, also the multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: stands for RAID I/O Steering, a type of RAID technology from Intel. RAIDIOS is a specification used to enable an embedded I/O controller, embedded on the motherboard, to be used as just an I/O controller or to be the I/O component of a hardware RAID subsystem. The RAIDIOS circuit allows an I/O Processor (either embedded on the motherboard or on an add-in card) to configure the I/O controller and service the I/O controller's interrupts. The I/O controller and the I/O Processor together are two of the primary components of a hardware RAID subsystem.

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data, is often used to refer to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SATA (Serial ATA): is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is a drop-in solution in that it is compatible with today's software and operating systems. It will provide for systems which are easier to design, with cables that are simpler to route and install, smaller cable connectors, and lower voltage requirements.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

SIMM (Single In-line Memory Module): formally the most common form of RAM for motherboards. They must be installed in pairs, and do not have the carrying capacity or the speed of DIMM modules.

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SSI (Server System Infrastructure): an industry initiative intended to provide ready-to-use design specifications for common server hardware elements (chassis, power supplies, and racks) to promote and support server industry growth.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

Striping: see RAID

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR: Zero Channel RAID. PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shift the processor over and down, guiding into the board and locking it into place.

Technical Support

If a problem arises with your system, you should turn to your dealer for help first. Your system has most likely been configured by them, and they should have the best idea of what hardware and software your system contains. Furthermore, if you purchased your system from a dealer near you, you can bring your system to them to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: http://www.tyan.com
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and
This device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada
This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

Notice for Europe (CE Mark)
This product is in conformity with the Council Directive 89/336/EEC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

Document #: D1800-110